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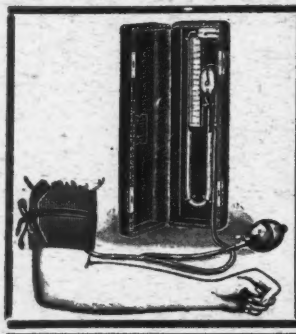

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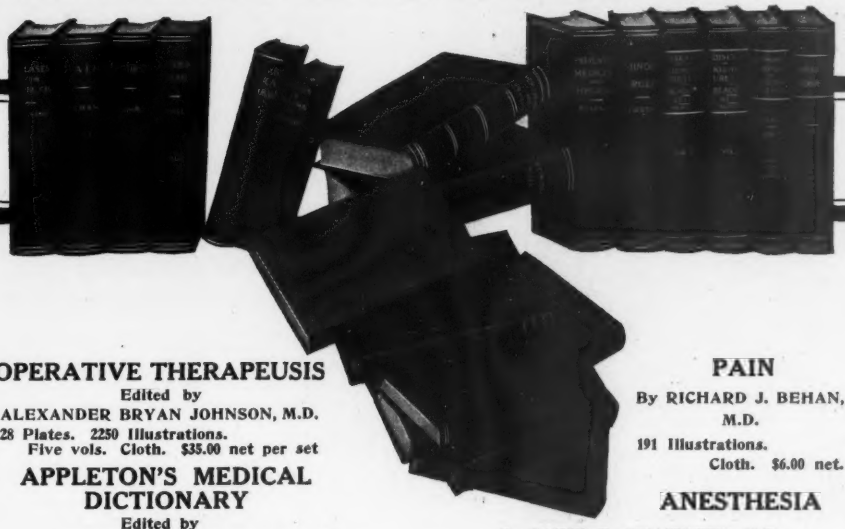

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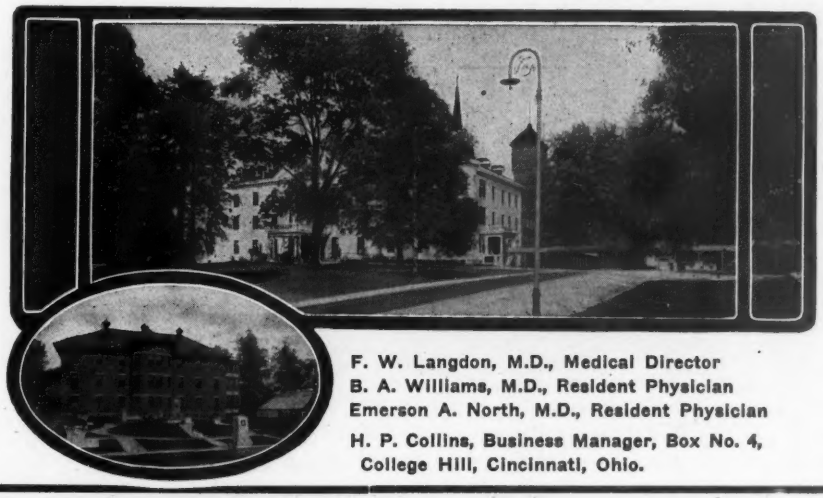

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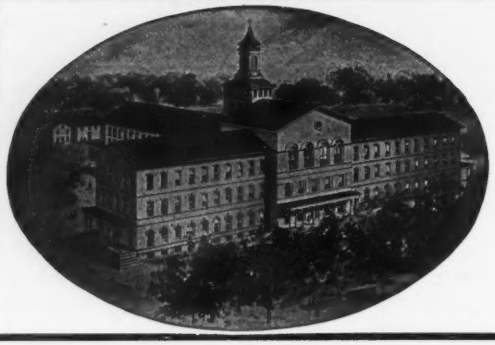

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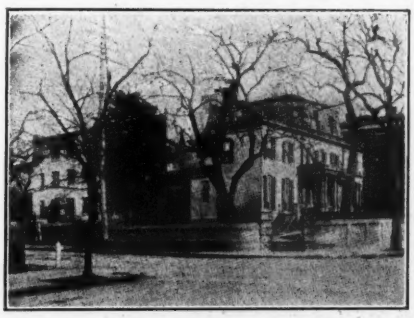

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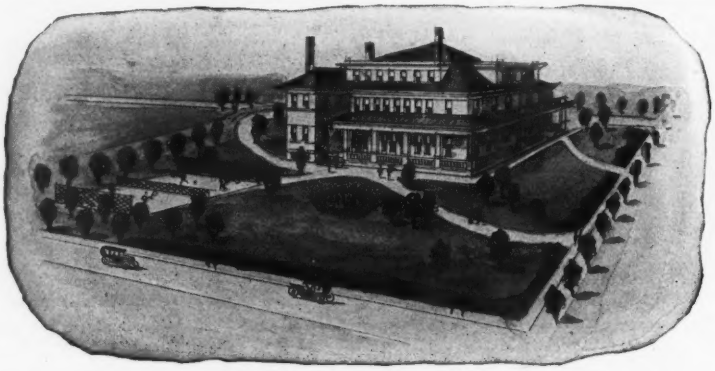

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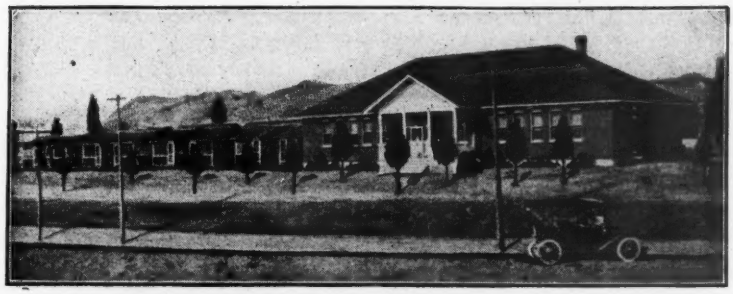

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SUBJECT	Total Hours Lectures or Recitations	Total Hours Laboratory Work	Total Minimum Hours Didactic and Laboratory
Physics, 1	64	128	192
Chemistry, 1	64	128	192
Biology, 1	64 or 96	128 or 64	128 or 160
German or French, 2	128 or 96	----------	128 or 96
Totals	320	384 or 320	704 or 640

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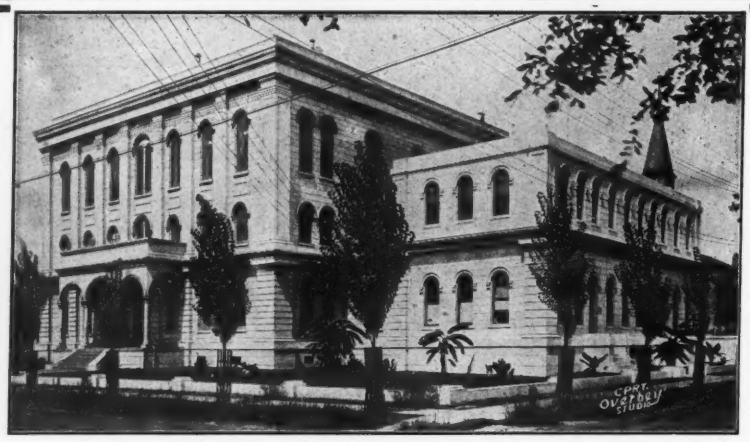

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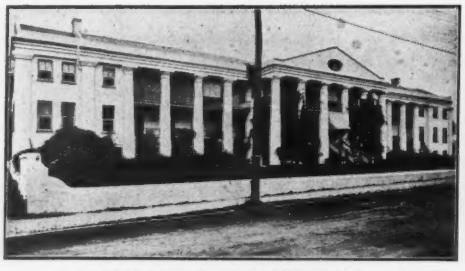

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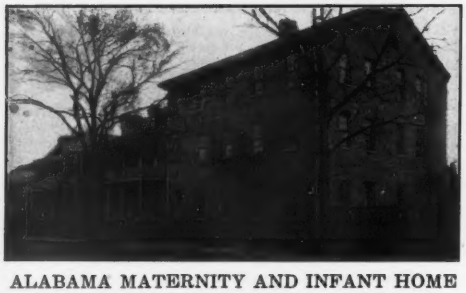

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MEDICINE

(INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.)

A STUDY OF SPARTEINE SULPHATE*

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OUTLINE

1. Introduction.
2. Pharmacology.
3. Therapeutics.
4. Methods and results of research.
5. Resume.
6. Conclusions.

INTRODUCTION

On account of the confusion and contradictions concerning clinical experiments and the results obtained from animal experimentation with the use of sparteine sulphate, the author was led to conduct a series of experiments upon animals, with the hope that it might be of benefit to the therapeutist who is still in doubt as to the true value of this drug. We find upon examination of the literature on the clinical use of sparteine, that a number of very careful clinicians have found it is a most reliable cardiac stimulant and diuretic. Wolferton[1] in his investigation found that it was superior to digitalis. He speaks of its diuretic effect and lays stress upon its reliability. Others claim that it causes a marked rise in blood pressure. Some[2] assert that the pharmacopeal dose is too small and if results are to be expected, large doses must be administered. Julien[3] found that the drug administered in doses of 0.02 to 0.03 gramme caused a rise in blood pressure and that the heart was strengthened, and that its action differed when administered to healthy and sick subjects. In healthy subjects he found that it quickened the action, while in pathological conditions it regulated it. Others tell us that they have found the drug unreliable and have ceased to use it. I have found upon inquiry clinicians who have used it in chronic heart diseases with good results. Others who have used it for its diuretic effect, claim that it produces marked diuresis in dropsical conditions of cardiac origin; some use it in shock and collapse. Petty[5] found it to be a true heart tonic and a reliable diuretic in 0.130 gramme doses, especially in post-operative suppression of urine.

On the other hand we find the pharmacologist claiming only a depressing action for the drug. Cushny[6] says the whole effect points to a paralysis of the motor nerve terminations and of the sympathetic ganglia and that it depresses the heart so that the contractions are weak. Pilcher and Solman[7] in a series of experiments found that the drug was without effect upon the vasomotor center, except for the depression of the respiration which tends to produce asphyxial stimulation of the center.

Bastedo[8] says it retards and weakens the heart by direct depression of the heart muscle and by stimulating the ganglia on the vagus nerve. McNider[9] found in a series of experiments for its diuretic effect on the dog that large doses produced a diuresis, but failed to get results in other experiments and suggested that the samples might vary in potency.

*From the Pharmacological Laboratory of the Medical College of the State of South Carolina.

PHARMACOLOGY

Sparteine is obtained from the common broom plant, a native of Europe and Asia and naturalized in this country. Broom or scoparius contains besides this alkaloid, a neutral principle, scoparin, occurring in

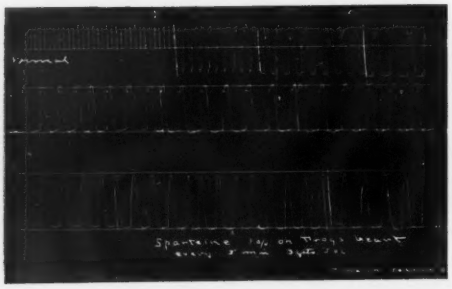

Fig. 1(a).
Frog.—Suspension Method. Three drops applied every 3 minutes. Bottom line represents heart's action three minutes after 4th application. The lever moves upward in systole. (Contrast with tracing under digitalis.)

Fig 1(b).
Frog's Heart.—Showing the comparative effect of digitalis. Three drops applied every 3 minutes. The lever moves upward in systole.

pale yellow crystals and to which the diuretic effect is due when the infusion is administered. Sparteine was first discovered by Stenhouse in 1851 and occurs as a transparent oily liquid. The sulphate is the official salt. It belongs to the conium, lobeline, gelseminine group, a class of drugs that paralyzes both motor endings and ganglia, or rather the myoneural juncture which is the term used for the true seat of action, which has been found to be between the end of the nerve and the contractile muscle substance. Green[10] says that sparteine has a more toxic peripheral action and a less vigorous action on the central nervous system than the other members. Upon blood pressure it has a depressant effect due to its action upon the heart muscle.

THERAPEUTICS

Sparteine has been used as a heart tonic in chronic valvular diseases and in cardiac arhythmia. It is recommended in dropsy of cardiac origin; in anuria and after surgical operations for suppression of urine.

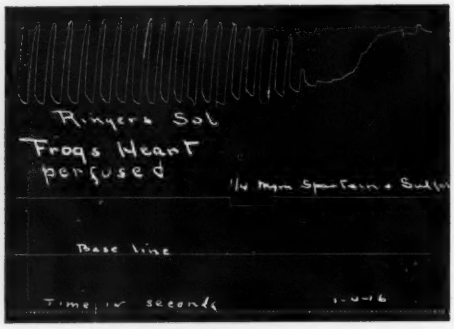

Fig. 2.
Frog's Heart—Perfusion Method. Heart first perfused with Ringer's solution. At point indicated on record 0.25 mgm. was injected with rubber tube leading to heart.

The average dose given in the Pharmacopea is 0.012 gramme. This is said by some to be ridiculous. Some claim that in order to get the true effect, at least 0.130 gramme must be given every 2 to 6 hours. Others that from 0.300 to 0.650 gramme

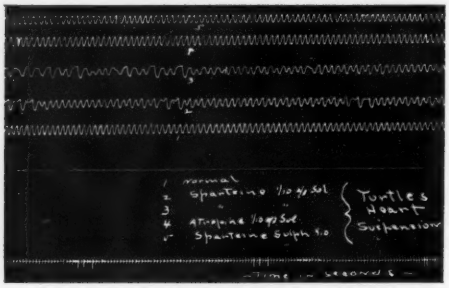

Fig. 3.
Turtle.—Suspension Method. Three drops applied every three minutes—(1) normal. (2 and 3) sparteine sulphate. (4) atropine after sparteine. (5) sparteine after atropine. Kymograph moves from left to right. Upper stroke represents diastole.

must be given to get the true effect. The confusion that exists as to the dose is very marked. It was these contradictory

statements that led to this investigation, which consists of almost all the methods used today in a similar research. It has been my aim in this series of experiments to show the action of sparteine sulphate upon animals from the lower to the higher. This will be followed as closely as possible by a clinical research.

METHODS AND RESULTS OF RESEARCH

Frogs, turtles, rabbits, and dogs were used in this investigation. The methods with results are given in order. The drug

Fig. 4.
Turtle.—Heart first perfused with Ringer's solution. At star 0.25 mgm. sparteine was injected in rubber tube leading to heart.

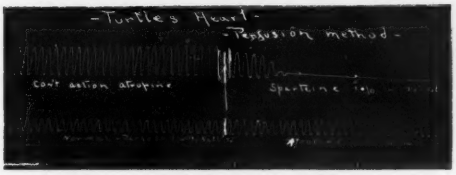

Fig. 5.
Turtle.—Heart first perfused with atropine and then with sparteine sulphate.

was used dissolved in NaCl 0.75 per cent for frogs and turtles, and NaCl 0.9 per cent for the higher animals.

FROGS.

Suspension Method.—The animals were pithed (brain destroyed) and their hearts bared. Time was allowed for the animal to recover from the shock. The suspension method was used for obtaining records of the heart's action. This consisted of connecting the apex of the heart to a lever which recorded the contractions upon revolving kymographs. The drug, sparteine sulphate, was applied in 0.1 per cent and 1 per cent solutions—3 drops every three minutes. At the end of three minutes the kymograph was allowed to revolve.

As seen by record No. 1, the rate of the heart was decreased, the diastole and systole being lengthened. The increase in amplitude noticed on the record was proved to be due to a weakened and relaxed heart muscle. The difference between the action of this drug and digitalis when applied to the frog's heart is very noticeable. The slowing of the heart under digitalis is followed by a strong systole which is absent with this drug. See Rec-

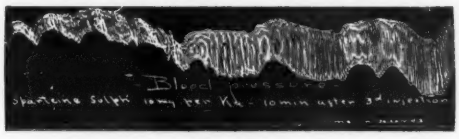

Fig. 6.
Dog.—Showing toxic effects from third dose of 10 mgm. of sparteine sulphate. Approching asphyxia.

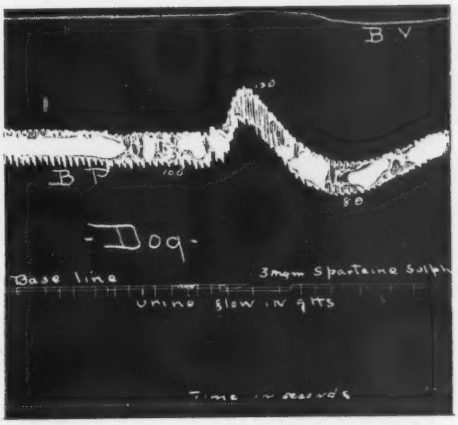

Fig. 7.
Dog.—Showing the effect of 3 mgm. of sparteine sulphate upon blood pressure and urine flow. Base line represents zero blood pressure.

ord No. 1-B. In all, about twenty-four (24) frogs were used. The normal heart rate was taken and then at intervals of three minutes. The following chart will serve to show the action on the heart.

Sparteine sulphate 1-10% sol. Three drops applied to frog's heart every 3 minutes.

Experiment No.	1	2	3	5	5	6
Normal	10	9	10	8	10	11
After 3 min.	6	3	4	4	4	6
After 6 min.	4	3	4	4	4	6
After 9 min.	4	3	4	3	3	4
After 12 min.	4	3	4	3	3	4
After 15 min.	4	3	4	3	3	4

The drug did not seem to be toxic to the animal. Atropine first was applied to the hearts of several of the animals, the rate was slightly quickened,

but when sparteine was applied the heart decreased in rate.

A series of hearts were suspended in a glass chamber, the apex being attached to a rod at the bottom, the base being tied to a lever for recording its action on a revolving kymograph. The heart was first immersed in NaCl 0.75 per cent and then in a 0.1 per cent solution of the drug in NaCl 0.75 per cent. The heart was slowed immediately and in some instances ceased to beat at once, but recovered upon being removed from the solution.

Perfusion method.—In this series of experiments the frogs were pithed and a glass cannula

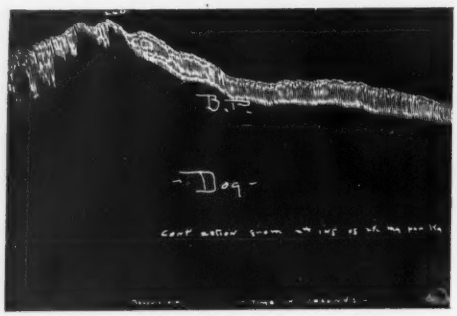

Fig. 8.
Showing the continued action after 4th injection. Toxic effect.

placed in the sinus venosus and the heart connected with a perfusion apparatus. The apex was connected with a lever for recording the action on a smoked drum. The heart was first perfused with Ringer's solution and while being perfused 0.015 gramme of sparteine sulphate was injected into the rubber tube leading to the cannula.

As seen by Record No. 2, the heart ceased to beat almost instantly, but recovered upon being perfused with Ringer's solution.

One Hour Method.—A series of frogs were injected with 0.125 mgm., 0.250 mgm., 0.5 mgm., 1 mgm., 2 mgm., 3 mgms. of sparteine in solution,

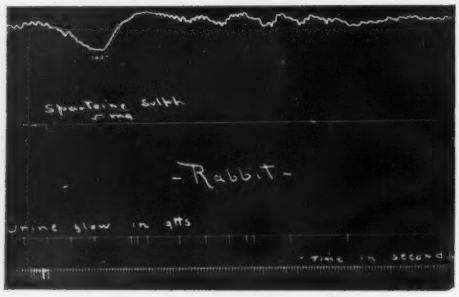

Fig. 9(a).
Rabbit.—Showing the effect of 5 mgm. of sparteine sulphate upon blood pressure and urine flow when injected intravenously.

the drug being injected into the anterior lymph sack. They were carefully marked and placed under bell jars, and were all alive at the end of one hour. The frogs that were given the larger dose were pithed and the hearts bared; they were found to be very slow and dilated.

TURTLES.

The suspension method was also used with turtles and the drug applied every three minutes, 1.0 per cent and 0.1 per cent solutions were used. In each experiment the normal average was reduced from six in ten seconds to three in ten sec-

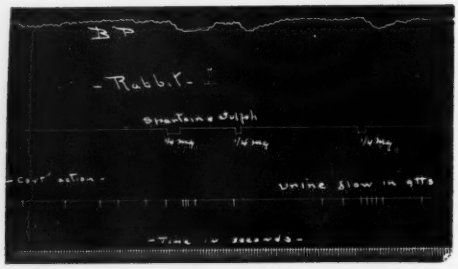

Fig. 9(b).
Showing the continued action from 5 mgm. of sparteine sulphate and from the injection of small doses repeated.

onds. As with the frog the amplitude was greater, but this was due to the muscle's relaxing or stretching. The heart was not paralyzed even when the organ was flooded with the drug, but gradually became smaller and only after several hours ceased to beat.

As seen by Record No. 3, a normal tracing was made (a Cushny myocardiograph being used). Sparteine was applied and resulted in a slowing of the heart, which became very irregular. Atropine sulphate was applied in 0.1 per cent solution. This removed this action so that the heart became regular again. Sparteine was again applied, but as

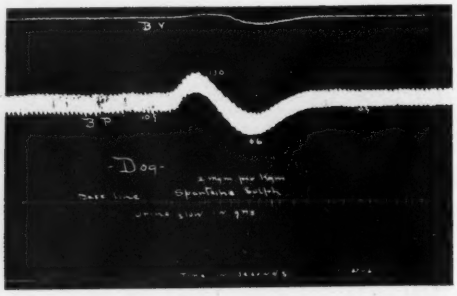

Fig. 10.
Dog.—Showing the effect upon blood pressure and urine flow of 2 mgm. of sparteine sulphate injected intravenously. Base line represents zero blood pressure.

noted by record, without effect, except to cause the heart to become smaller and weaker.

Perfusion Method.—This was also used with the turtle's heart. An apparatus of the Williams type was employed. The heart was first perfused with Ringer's solution. The normal outflow in drops as well as the pressure was recorded with a water manometer. The apex was connected to a lever through a pulley for recording the action on a revolving drum. As shown by Record No. 4, upon injection of 0.250 mgm. into the perfusion liquid, the heart became smaller and weaker. The normal rate in outflow was 3 in 10 seconds, the water

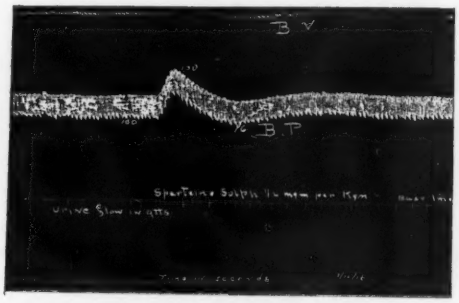

Fig. 11.
Dog.—Showing the effect of 0.5 mgm. of sparteine sulphate upon blood pressure and urine flow. Base line represents zero blood pressure.

manometer registering 24½, 3 minutes after injection; the outflow from the heart was one drop in 10 seconds, and the manometer registered 23½. The heart recovered after perfusion with Ringer's solution. Atropine sulphate in 0.1 per cent solution was used first and followed with sparteine. As seen by Record No. 5, the heart ceased to beat almost immediately.

RABBITS.

The rabbits used were all healthy specimens of average weight. This experiment consisted of weighing the animal and using urethane anesthesia. The glass cannula was placed in the carotid artery for blood pressure tracing; a bladder cannula was inserted to record the flow in drops of urine; and the drug was injected in measured doses into an ear vein with a hypodermic syringe. A record was made of the heart, respiration, urine flow, and blood pressure, before and at five minute intervals after the injection.

The average dose injected was 5 mgm, with the following results: There was immediately upon injection of the drug, a fall in blood pressure; and the heart rate was reduced from 39 to 33 in ten seconds. The respiration was at first unaltered, but upon the second and third injections it became deep and labored at first, and then decreasing from 7 to 4 per ten seconds. The urine flow decreased from 3 in 10 seconds to 3 in 20 seconds. In several of the experiments the urine flow ceased altogether. The average record for several experiments in which the drug was injected in repeated doses, was blood pressure normal 100, heart 39, respiration 7, urine flow 3 in 10 seconds. After injection of drug, blood pressure 87, heart 25, respiration 3 and urine flow 0.

As seen by Record No. 9, there was first a fall and then a slight rise. During the rise there was a slight increase in the flow of urine, but this gradually decreased and after about one hour ceased altogether. The vagus is not tonically active in the rabbit, so that the fall in blood pressure as noted on the record is due either to a de-

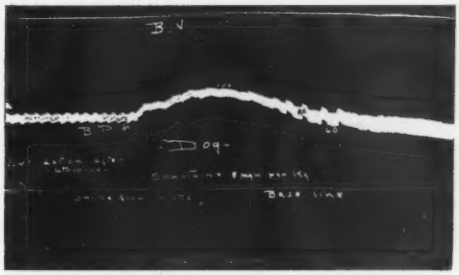

Fig. 13.
Showing the effect of sparteine after atropine. Signal line, zero blood pressure.

pressant action upon the heart muscle, a depressant action upon the accelerator mechanism, or to a dilator effect.

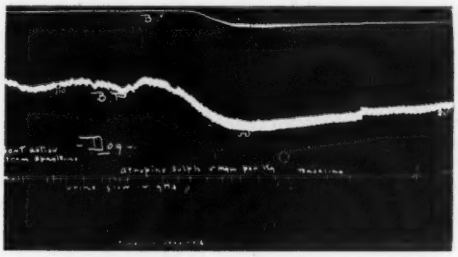

Fig. 12.
Dog.—Showing the effect of 5 mgm. of atropine after sparteine sulphate. Signal line zero blood pressure, mercury manometer.

The following protocol will illustrate the method used in obtaining records of the experiments on rabbits and dogs. (Rate of heart and respiration is given in 10 seconds.)

Animal—Rabbit.
Weight—1.565 Kg.
Time—12:25 P. M. Urethane 50 c.c. 6 per cent sol. by stomach tube.
12:40 P. M.—Heart 39, respiration 7, blood pressure 100, urine flow 3 drops in 10 seconds.
12:45 P. M.
Sparteine sulphate 5 mgm. in ear vein.

12:50—Heart 33, respiration 7, blood pressure 92½, urine flow 3 in 20 seconds.

1:00 P. M. Heart 35, respiration 5, blood pressure 99, urine flow 3 in 10 seconds.

1:15 P. M. Sparteine sulphate in vein.

1:20 P. M. Heart 33, respiration 6, blood pressure 105, urine flow 3 in 20 seconds.

1:45 P. M. Heart 33, respiration 4, blood pressure 100, urine flow 0.

1:50 P. M. Heart 32, respiration 4, blood pressure 112, urine flow 1 in 30 seconds.

2:05 P. M. Heart 25, respiration 3, blood pressure 87, urine flow 1 in 30 seconds.

DOGS.

The animals used in this research varied in size, age and sex. They were carefully weighed and morphine-ether anesthesia was used. A cannula was placed in the carotid for blood pressure tracing. The drug was injected in measured quantities into the femoral vein through a glass cannula inserted for this purpose. In most of the experiments the kidney was placed in a copper oncometer with a rubber bag filled with water which led to a water manometer for registering the volume. In a majority of the experiments a glass bladder cannula was inserted for registering the urine flow. It is customary to insert the cannula in the left ureter. I have found that the failure to obtain results in some instances is due to the small opening in the tube becoming stopped up, or the kidney being damaged by being placed in the oncometer. With the cannula in the bladder, the flow is obtained from both kidneys.

Varying amounts as well as different makes of the drug were used in this experiment as well as all of the others. The smallest amount given was 0.5 mgm. per Kg., the largest 10 mgm. per Kg. A record of the heart, respiration, blood pressure, oncometer, and urine flow was carefully recorded.

As seen by figures No. 7 and No. 10, there occurred with each injection a sudden rise in blood pressure followed immediately by a fall. It was noted that the rise after the second and third injections were not so high as with the first.

In all of these experiments the blood pressure did not return to normal until large doses had been administered. With the administration of small and large doses it was noted that the respiration was depressed and that the heart was more or less irregular, the respiration finally ceasing before the heart. There was also a decrease in kidney volume; and after a slight increase in urine flow, which occurred at the initial rise and fall, there was a decided decrease. In some of the experiments the urine ceased to flow altogether.

In every experiment upon dogs the drug proved fatal. In one experiment the first injection of 5 mgm. per Kg. proved fatal. Artificial respiration through the trachea failed to relieve this condition.

There was with one animal a rise of blood pressure without the fall, as seen in figure 11. This occurred with the first injection of 0.5 mgm. per Kg. With this animal there was a slight increase in kidney volume and urine flow, but this did not last. The heart and respiration were decreased in rate with each successive dose.

The following experiments were carried out upon several of the animals: Atropine in 5 mgm. doses was injected after sparteine, and as seen by figure 12, there was a decided fall in pressure. In others, sparteine was injected after atropine, and as seen by figure 13 there was a gradual rise in blood pressure. This always proved fatal.

RESUME.

1. Sparteine is not toxic to the frog. The heart is slowed and weakened by a depressant action upon the heart muscle and by a stimulation of the vagus endings.

2. Sparteine slows the turtle's heart by stimulation of the vagus endings and by a depression of the heart muscles.

3. Sparteine slows the heart of the rabbit. It slows the respiration, decreases the flow or urine, and causes a fall in blood pressure.

4. Sparteine causes a preliminary rise of blood pressure in the dog, followed by a fall. The fall was not so marked when small doses were given. The kidney oncometer shows a decrease in volume in a majority of the experiments. There is a slight increase in urine flow with the rise and the first fall.

The experiments did not prove conclusively the cause of the rise in blood pressure, but the results obtained with the kidney oncometer tend to show that it is due to a vaso-constrictor action. The fall is due to stimulation of the vagus. This is proven by first injection of atropine and afterward by sparteine. Atropine seems to increase the toxicity of sparteine.

CONCLUSIONS

Sparteine is not a cardiac stimulant. It is a depressant to both the heart and respiration. Death is due to failure of the respiration, aided by the action of the drug upon the heart muscle.

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CLINICAL VALUE OF VARIOUS "DIGITALIS" DRUGS AND PREPARATIONS.

By J. T. Halsey, M.D.,
New Orleans, La.

Any perusal of standard text-books or of current literature, especially the advertising portion of it, will reveal a great diversity of views as to the relative value of the different preparations of this drug and of the different members of its group. Some authors attribute to certain preparations, either official or proprietary, advantages which they do not possess; while very erroneous views are widely prevalent as to the relative value of various members of the group, notably strophanthus, squill, and apocynum.

The discussion of the relative value of the various drugs making up this group may be started by the somewhat dogmatic statement that, from the standpoint of the clinician, they differ from each other mainly in the rate and certainty with which they are absorbed and excreted and in their local action before absorption. Clinically there appear to be no qualitative differences of practical significance in their all-important actions on the circulation. And all who have sufficiently investigated their clinical effects have reached the conclusion that once it has been absorbed in sufficient amounts, digitalis produces all the desirable effects which may be produced by any of the others. Further, it has been established that, contrary to very generally held views, digitalis is absorbed more rapidly and certainly and is less irritant to the stomach than any of its congeners.

This statement is in direct opposition to what has been very generally believed, especially in connection with the clinical effects of the administration of strophanthus. Many of the older text-books (and some of the newer ones) state that, as strophanthus is absorbed more rapidly and is less irritant to the stomach, it is to be preferred to digitalis where prompt action is desirable or where the digestion is disturbed. The real facts are directly opposed to this.

Today it can be stated positively that strophanthus should never be given except intravenously or intramuscularly. The basis for this positive and, doubtless to some surprising, statement is as follows: When given orally or rectally strophanthus is absorbed so slowly, destroyed so rapidly, and, after absorption, is excreted so quickly that almost invariably, when it is thus administered, the circulation is little if at all affected. Occasionally, it is true, the drug is absorbed in sufficient amounts to produce the desired effects. On the other hand, fortunately but rarely, strophanthus administered orally and in ordinary dosage has been absorbed so completely and rapidly that it has produced serious and even fatal poisoning. This possibility may be remote and may even be doubted by those unfamiliar with the facts, but it is too serious a contingency to be viewed with unconcern, and I believe myself justified in the dogmatic statement that this drug should never be given orally.

Perhaps the reader may be convinced of the correctness of this view by the following considerations. Tincture of strophanthus as ordinarily dispensed is from one hundred to two hundred times as toxic as the tincture of digitalis. Who would be willing to give a patient a fluid ounce of tincture of digitalis three times a day? Yet that is a less poisonous dose, should complete absorption occur, than a physician is prescribing when he directs that five minims of the tincture of strophanthus be taken thrice daily. Or who would dare to administer hypodermically one or two ounces of digitalis tincture or its equivalent? Yet that is what the surgeon does when, during or following an operation, he orders a "hypo" of five minims of the strophanthus tincture.

There is but one way to give strophanthus[1] and that is intravenously, using, if it be obtainable, either the *crystalline* strophanthin or ouabain[2] in dosage not to exceed one-half of a millegram (1/120 of a

1. Strophanthin is occasionally given hypodermically, deep in the muscles; but these injections are so extremely painful that they should never be made unless it is impossible to give the drug intravenously and the indication for rapid "digitalization" is urgent.

2. If neither of these is obtainable, the amorphous strophanthin, in dosage not exceeding one millegram (1/60 gr.), or a standardized tincture of strophanthus, diluted so that one ccm. (m xv) contains fifty heart units, may be used. Of this, not more than one ccm. may be given.

grain), reserving such use of it for cases urgently needing a "digitalis" effect, and never giving it, except in still smaller amounts, to patients who have been taking digitalis or any of this group in the recent past. This dose may be repeated, if needed, in eighteen to twenty-four hours. Its effects are usually apparent in fifteen to thirty minutes and persist for twenty-four hours. Used in properly chosen cases and in proper doses, the prompt and useful effects of this drug are among the most gratifying and dramatic therapeutic results I have ever achieved.

In regard to the clinical value of apocynum and squill, it may be that the last word has not yet been said, but I can and do state most positively that I have never seen either of these drugs do good in any case in which digitalis had failed after a fair trial, although I have often given them under such conditions. This is not by any means the same thing as saying that these drugs can not do good under certain conditions. They can do good, and I have seen them do so, but in the light of our present knowledge I am of the opinion that they have no advantages under any clinical conditions over a good preparation of digitalis. Remembering the reputed and real diuretic powers of squill, the reader may be inclined to question this statement. If, however, he remembers the diuresis he has so often seen result from the use of digitalis and if he is familiar with the irritant action of squill on the kidneys, he may appreciate the grounds for this view.

In a discussion of the relative clinical value of various digitalis preparations, it is to be emphasized that what the physician wants is a preparation of constant strength and of reasonable stability, which lends itself to easy administration. With many others I believe that these desiderata are found in a tincture of digitalis, provided it be one which has been standardized by biological methods so that each minim represents a definite amount of therapeutic activity. While at times digipuratum (see below) may be preferable, with the vast majority of patients a good tincture of known strength will do all that can be expected of any other preparation of this drug. Its advantages over the other official preparations may be summarized as follows: More uniform strength, more rapid absorption, and less disturbance of the stomach than with the powdered leaves; more uniform strength, greater stability, and smaller dose than with the infusion, as ordinarily obtainable. Theoretically the fluid extract should be quite as good a preparation as the tincture, but in clinical use this does not appear to be the case.

The view that either the leaves themselves or the infusion more completely represent the therapeutic activities of the drugs should be relegated to its place among other delusions of the past. This is another statement which may appear incorrect to those who can remember clinical experiences apparently contradicting it. It may be granted that in the doses ordinarily used the infusion has often succeeded where the tincture had failed; but if one remembers that the (10%) tincture should be less than seven times as potent as the (1.5%) infusion, it is not to be wondered at if doses of a half ounce of the infusion (3.6 grains of the leaves) produce an effect where ten minims of the tincture (one grain of the leaves) have failed.

Inasmuch as clinical as well as laboratory experiences have shown that there is a relatively small difference between doses too small to produce any favorable effect and those which do produce it, and that doses only a little larger than those which do good, can and do cause more or less serious poisoning, it is evident that it is not only desirable but is actually essential that we should use only preparations of known strength. How necessary this is, is shown by the results of various investigators who have determined the potency of different tinctures of digitalis. Even where the tinctures were those prepared by firms of the highest r[illegible]ute, the differences between the products of different firms range as high as 260%[3]. To one not accustomed to think along these lines, this may not appear very important, but it can readily be seen that it would make a very serious difference to a patient if he were

3. Worth Hale, Bulletin 74 of the Hygienic Lab., p. 37, and Roth, ibid. 102, p. 28. Roth also found that "fat-free" tinctures possess no advantages over ordinary ones in respect to stability or uniformity.

to take ten drachms of the tincture instead of the four drachms that were ordered, and in effect this is what would happen should, in the renewal of a prescription, one of these stronger tincture be dispensed. Tinctures purchased at the corner drug store differ even more widely in their strength, so that one specimen may be fourteen times as potent as another.[4]

How can we help ourselves out of this difficulty? For every day practice the best plan is to insist that our druggists should keep on hand and always dispense on our prescriptions the physiologically standardized product of one and the same manufacturing chemist. It is best to choose one which carries on its label a statement of the number of "heart units" (abbr. H. U.) per c.cm.

For various widely advertised proprietary digitalis preparations, a number of extravagant and false or misleading claims are made. Among the commonest of these is the claim that the preparation in question is free from cumulative action. It may be asserted without fear of successful contradiction that any preparation of digitalis free from cumulative action is also without therapeutic value.

Another claim made by certain advertisers is that their preparations do not cause emesis. Here again it can be positively affirmed that all at present known digitalis active principles will and must at last occasionally, cause vomiting if given in sufficient dosage to produce the desired effects on the circulation. However, for one proprietary with which I am acquainted, there is some justification for this claim. I refer to digipuratum, which has been mentioned above. In this preparation the digitalis active principles are present in a form in which they are insoluble in the stomach. Consequently they do not irritate the gastric mucosa, although after absorption they, like all digitalis bodies, stimulate the emetic center and consequently can and do cause vomiting. I believe, however, that this particular preparation is less likely to upset the stomach than any other with which I am acquainted, and I have found it of real value in certain cases in which from the start ordinary digitalis had caused vomiting or gastric distress. Digipuratum is, however, a preparation of very uniform strength, and were it not for its high cost I would never use any other for oral administration.[5]

There is one other widely used official digitalis preparation, concerning whose value entirely erroneous views so generally obtain, that the truth should once more be placed before the profession. This is digitalin, in whose cardiac stimulant power and freedom from local irritant action a large number of the profession have a misplaced confidence. I have never met any one who has been on the patient's end of a hypodermic injection of digitalin, and who still shared the illusion that it was non-irritant. As to its therapeutic efficiency, the following facts speak for themselves. Digitalin, as commonly used, is the so-called digitalin germanicum, which is a mixture of varied composition and of uncertain strength. Different samples as purchased vary in strength so that some are more than twice as powerful as others.[6] One-sixtieth of a grain of this preparation is equal in therapeutic activity to from three to five minims of an average tincture of digitalis.[7] If this statement be accepted (and it rests on incontrovertible facts) what becomes of the wonderful results obtained by giving 1/60 or even 1/20 of a grain of digitalin?

4. Stewart, F. E., J. of Am. Pharmaceut. Ass'n, 1912, v. 1, p. 1452; in fifty-one samples of tincture of digitalis found a variation from 30% to 443%.

5. Digipuratum is also available in liquid form, in ampoules, which can be used for intravenous injection. As I have had no personal experience with this liquid preparation and have been unable to find anything in literature bearing on its stability, I do not feel justified in recommending its administration intravenously.

6. Hale White and Roth, loc. cit. pp. 25 and 32, respectively.

7. Determined by comparison of Worth and Roth's assayed values of digitalis and digitalis tinctures.

THE BOWEL FLUXES OF BABIES.*

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The treatment herein outlined is entirely empirical in origin. This is not to

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be wondered at, for when I was growing up, the practice of medicine was practically all empirical. Most of what might then have been thought to be scientific has proven to be very unscientific, but science has explained the good of some of our empiricism. It has shown how cinchona cured chills, and how ipecac, the "radix antidysenterica" of its introducers, cured dysentery. So I hope science, if it did not lead me, will show why the remedies I use and recommend are good in the particular forms of bowel trouble for which each is recommended.

Experience has taught me to divide baby bowel fluxes into three classes, generally well distinguished from each other, but occasionally blended. When distinct, each has its specific line of treatment; when blended, there must be a blending of treatments.

First we have the green diarrhea of children living on milk, or largely so, whether it be mothers milk or a modification of cows' milk. The color may be as green as grass or only a greenish yellow. Small curds are generally found mingled with the green fecal matter. The odor is that of sour milk. The buttocks are frequently excoriated, more so, I think, than with either of the other forms.

The second is frequently known as teething diarrhea, though I don't believe teething has much to do with it. This generally occurs when the child is on a mixed diet. The actions are of variable shades of brown, yellow or possibly greenish, and generally very watery. The distinctive characteristic, however, is the odor, very similar to that of a rotten egg.

The third is dysentery with its mucous and bloody stools, small, frequent and painful,—generally but not always with tenesmus.

From 1866, when I began practice, 'till May, 1889, I had failed to find a treatment at all satisfactory for the green diarrhea. At this time for another reason I gave to a little fellow with dysentery, the fecal part of whose actions was grass green, some sodium hyposulphite. The next day, to my surprise, the fecal part was bright orange. I took a hint from this and began prescribing the hyposulphite for the green actions, and with generally satisfactory results. I generally prescribe every two or three hours about a grain to the year of age, making more in proportion for a child under a year old. If I don't get good results, I increase the dose even to the point of purging, when the discharge is very sure to become yellow and be rid of curds. I have had very few failures with this remedy.

In June, 1872, my second boy, about ten months old, walking around holding to chairs, etc., was taken with a watery, foul-smelling diarrhea. It continued. He became emaciated to a skeleton. Late in the Winter I began feeding him rare, broiled tenderloin of beef, into which was rubbed a goodly amount of subnitrate of bismuth. He improved, grew strong, and in June was again walking around the chairs.

About this time I got from a new book,—Smith on Diseases of Children,—a prescription embracing for a dose for a child one year old five grains of bismuth subnitrate, two and a half grains of aromatic chalk, and one-twenty-fourth of a grain of opium. It proved to be better than that I had used, but not satisfactory, undigested food continuing to appear in the stools, though stiffening and becoming less offensive.

By some inspiration I was led to add one-twelfth of a grain of calomel to each dose. Then, in effect, it was ideal; the patient generally becoming better in twenty-four hours, and in forty-eight hours well on the way to recovery, needing only an occasional dose to complete the cure. I concluded later that the chalk was superfluous, and so omitted it, adding as an aromatic one-sixth of a drop of oil of anise. This combination I continue to prescribe, as I have never in the forty-two years intervening found anything "just as good." To improve its palatability, I add to each twelve powders one scruple of sugar.

My prescription for the third, the dysenteric trouble, I got from West on Diseases of Children, which book was recommended to me by Prof. James Jones at the time of my graduation, fifty years ago next April. Dr. West said he got the prescription from Dr. Baly, who had reported good results among the prisoners at Millbank Penitentiary, London. It consists of a combination of castor oil seven and a

half minims and a half drop of laudanum in an emulsion, to be given every three or more hours according to frequency of action.

Sometimes I put into this an "intestinal antiseptic," whatever that may mean, such as salol, sulphocarbolate of zinc, etc. I doubt that they do any good.

In case of high fever in any of these, I use tepid sponging, sometimes a cool enema, or moderate dose of phenacetin. I do not consider these curative, but only palliative and temporary 'till the cause of the fever can be relieved.

Sometimes I begin with a dose of oil; this more frequently when the bowels have been constipated and I fear are not yet emptied.

In the diarrheas, fever, when it occurs, is secondary; in the dysentery it is primary as in other infections.

A few words with regard to the remedies will, I think, be appropriate.

There is no generally accepted idea as to the cause of the green color of the actions. They smell sour, somewhat like sour milk. In the few tests I have made, they turned blue litmus paper red. Forbes Ross ("Intestinal Intoxication of Infants"), attributes the color to too great acidity of the gastric contents caused by the ferments of lactic and butyric acids and oidium albicans. To this last he attributes the irritation of the buttocks, as he has been able to make cultures from the irritated skin, even when the mouth showed no thrush. Sulphurous acid and the sulphites are *par excellence* the antagonists to those ferments. Hence the efficiency of the hyposulphite of soda.

Opium I use only where there is actively increased peristalsis, never to the extent of locking up the bowels. Other medicines act better when not too much hurried. In dysenteric cases, I think the inflamed bowel needs rest. I think, moreover, that the sedative action of opium on the nerve ends has a curative effect.

We formerly talked about the alterative effect of calomel, thereby admitting that we did not know how it acted. Forbes Ross (ibid) in discussing the antiseptic action of the bile, said that this characteristic was much enhanced by an infinitesimal quantity of calomel. Further, he said that the bile of a dog, to which a small quantity had been given, was rendered more antiseptic. This did not apply to other mercurials.

Now as to bismuth, when rightly used, it is a most excellent remedy, otherwise entirely negative. Given to a typical green diarrhea, it might as well be poured into a rat hole, for it is absolutely inert, passing through the bowels as a white mass, unchanged. But given a case in which sulphur in the form of sulphuretted hydrogen is a prominent characteristic, it is at its best. The sulphur unites with the bismuth, making a sulphide, blackening the stools, robbing them of their offensive odor and irritating character. Some have seemed to think that sulphur was necessary for the best action of the bismuth, and have given the two in combination, failing to realize that it was only when sulphur was *pathologic* that the combination was desirable.

William Hanna Thomson with others attributes to castor oil the property of causing a free flow of mucus from all mucous surfaces, Thomson even warning against giving it in an overflowing bronchitis lest you drown your patient. Nature relieves a congested or inflamed mucous membrane by promoting a free flow of mucus; and so we have the beneficial effects of oil in dysentery.

DISCUSSION.

Dr. H. Leslie Moore, Dallas, Tex.—I have the prescriptions and at the earliest opportunity I shall take great pleasure in trying them out. The doctor gave them to me some two or three weeks ago.

We have a most excellent baby camp here of thirty beds; but being hard pressed for time on account of preparing for this convention, I have not been able to test out his prescriptions. They are interesting, and I expect to give them a very thorough trial.

In our feedings and treatment at the baby camp we rarely use medicine. Our only medicine is protein milk or buttermilk. Protein milk is sometimes called Eweiss milk, and sometimes it is called albumin milk. We correct nearly all diarrheas of every description without the use of medicine, with the exception that in a few instances we give large doses of subnitrate of bismuth. We have been able to correct these diarrheas under this method of feeding; and the beauty of it is it is unnecessary to make a differential diagnosis. Treatment with the protein milk is just as good in one kind of diarrhea as another, so it makes it easy.

Dr. J. E. Stinson, Chickasha, Okla.—The paper we have heard is an excellent one, but it occurs

to me that the gentleman in reading it has overlooked a very important factor in the intestinal troubles of children. Whatever the initial cause producing intestinal disturbance in the baby may be, we have shortly after the diarrhea a mixed infection. We have got a number of bacilli that are at work.

If ipecac is given in amebic disturbances, and it is possible it is anti-germicidal to other infections, then ipecac is indicated. A combination in these troubles would embrace calomel, the fortieth of a grain; ipecac the sixtieth of a grain, and bismuth 1 grain. I have found great efficacy in this combination in treating the intestinal disorders of children, given four, five or six times a day, for any length of time you wish to continue it. I have seen any number of children suffering from cholera infantum and I have seen many die of this trouble. I have seen any number of them relieved with that as a routine remedy with nothing else more than an occasional dose of salts, castor oil, or some other cathartic given in the proper way. I believe in the efficacy of the prescription I have read to you, and that belief rests upon the fact that calomel and ipecac are anti-germicidal, and the combination gives the right effect. Ipecac is indicated in any type of flux, whether it be dysenteric or ilecolitis, no matter what it may be. It is a mixed infection, and we have an infection which should be met by germicides.

The doctor in the main covered the ground as it should have been covered, and yet I will insist that we must regard these troubles as infections, though possibly not primarily so. It may be possible that the slightest indiscretion in diet will produce the condition, but germicidal remedies are necessary.

Dr. O. W. Ross, Leona, Tex.—It seems to me that in all cases of bowel flux or infection of the stomach and diarrheas as a whole a very reasonable way and the best way is to assist Nature. Nature in bringing out purging has endeavored to get rid of infection. To give castor oil the first twenty-four or forty-eight hours, twice or three times a day, with absolutely no food, with water that has been boiled, cooled or given hot, seems to be the best plan. I consider that rational treatment in any case of gastroenteric disturbance. I consider that in any case in which there is vomiting and purging from gastro-intestinal irritation Nature is trying to get rid of the irritation causing either one or the other, and we should assist her. Then if the purging and vomiting keeps up to the extent of wasting the patient, we can use bismuth and opium. But we should assist Nature in the first forty-eight hours at least.

Dr. Rogers Hays, North Carrollton, Miss.—Nowhere in medicine are we so liable to get into the realm of poly-pharmacy as in treating babies for fluxes. The one thing that will cure babies of flux is a proper regulated diet, but unfortunately the laity will not let us employ this means, so we have to resort to the administration of medicines.

I have been using sodium hyposulphite in the treatment of fluxes for some time. I started using it with laudanum to control diarrheas in adults and afterward adopted it in cases of babies, and can heartily indorse it. We have in the bacillus lactis Bulgaris an agent which as far as I have been able to find out is absolutely harmless even when pushed to its limit, yet one which will accomplish a great deal in the treatment of these diseases.

Dr. Rufus C. Whiddon, Gainesville; Tex.—I would like to say one word to emphasize feeding and the use of buttermilk as a food in these fluxes. Of course, when cases touch our own families they are the ones that are most likely to make the deepest and most lasting impression upon us. The case I have in mind made a lasting impression upon me, as it was one of my own family. It touches the question of starving in these fluxes. My own baby had fallen into a chronic state of this condition; and after having exhausted my resources and those of my colleagues in my town, I called Dr. H. Leslie Moore, of this City, who advised buttermilk by forced feeding, if necessary, two ounces every two hours. The baby had refused to take any nourishment and would vomit that which it was forced to take by the mouth. But I started this treatment, giving two ounces of buttermilk through a catheter through the nose every two hours, and the baby made a wonderful recovery.

I do not think we should starve these babies. The infection demands that their strength be kept up so that they can fight it out. They should be fed something to keep up their strength; and I have found that buttermilk most often meets the demand. I always try it first.

Dr. J. W. Roberts, Irving, Tex.—Those of us who practice medicine in the country find it more difficult to get results from cows' milk. The reason, I think, is that the milk is not properly cared for. Of course there is no food that can be relied upon for all these cases; but certainly our results would be better could we have access to milk that had been properly cared for before administering it to our patients. I find that I get better results by giving them buttermilk instead of some of the modified forms. I have used the bacillus lactis Bulgaris tablets with very gratifying results in some cases.

Dr. John M. Cooper, Enid, Okla.—Three of the speakers spoke of buttermilk in the treatment of flux. I would like to know what form of buttermilk they have reference to, whether manufactured buttermilk or the old style.

Dr. J. J. Lockhart, Wells, Tex.—I want to substantiate what has been said about old style buttermilk.

Speaking of diarrhea in the algid form of malaria, I have had good success with small doses of calomel, ipecac and opium given every hour and continued 'till the effect is produced. At the same time I push bisulphate of quinine, using it for quicker and more dependable results.

This Fall I have had quite a number of cases of algid malaria among children, and in each instance I found that the above treatment works successfully.

With some of these patients I used intestinal antiseptics, and those who did not receive the intestinal antiseptics improved as rapidly as those who did.

Dr. I. L. Van Zandt, Fort Worth, Tex. (closing).—I do not ignore feeding, but thought a dis-

cussion of that would make the paper longer than desirable, and also obscure the points I wished to bring out.

I make a classification which I have not seen elsewhere. The first, the green, sour-smelling diarrhea is the result of too much acid; that with putrid, rotten egg smelling actions is perhaps the result of too little of the lactic acid, which with its bacillus is a natural disinfectant of the bowels. These are not primarily inflammatory, but may become so by the irritating effect of the contents of the bowel on its lining membranes. So fever in these is secondary and not primary.

Dysentery, on the other hand, is infective and febrile from the beginning, the fever sometimes even preceding the show of unnatural actions. I do not depend upon the medicines recommended alone, but give attention to diet and other matters of hygiene.

I admire the man who is able to accomplish all by dieting. In an institution with trained nurses this may be possible, but in private practice it is rarely practicable to get along without medicine; at least it is with me.

Dr. Rose seems to call our ordinary Summer diarrhea cholera infantum. I have reserved that name for cases resembling cholera morbus, or Asiatic cholera, in the adult, viz: vomiting and purging of such violence that in a few hours the babe with its sunken eyes and shrunken tissues resembles an old dried-up man. I have seen very few such cases, perhaps not more than a half dozen, in almost fifty years of practice.

THE FRACTIONAL METHOD OF GASTRIC ANALYSIS.*

By Douglas VanderHoof, A.M., M.D.,
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Richmond, Va.

The technique commonly employed for estimating gastric function is inadequate, inasmuch as it indicates but one phase in a constantly changing cycle, and that phase is by no means always the high point in the digestive curve.

The modified gastric tube introduced by Rehfuss and his colleagues, of the Jefferson Clinic in Philadelphia, is an adaptation of Einhorn's duodenal tube. The metal tip has slotted perforations which are of the same width as the diameter of the rubber tubing (No. 8 French). The tip, followed by the tube, is readily swallowed by most patients, and the tip is sufficiently heavy to seek the lowest portions of the stomach by gravity. The tube is given to the patient as soon as he has taken the test breakfast, and a sample of the stomach contents is aspirated at intervals (every 15 minutes) until the stomach is found to be empty.

We are all familiar with the inconsistencies encountered in ordinary gastric testing, which have caused us to place less and less reliance upon the examination of the test meal as an index of gastric function. The examination of the stomach secretions, however, together with the determination of motor activity, must continue to be the true method for estimation of gastric function.

The fractional method of stomach testing, which embraces the complete cycle of gastric digestion, gives a fairly complete cinematographic picture of the stomach's response to a definite stimulus. It promises to obviate the uncertain findings obtained by making an analysis of the test breakfast, removed in the usual manner at the end of one hour. As Rehfuss has pointed out, it is as absurd to expect information of gastric function from the examination of a single specimen of stomach contents at an isolated phase as it is to obtain an accurate idea of renal efficiency from the examination of a single specimen of urine after the administration of phenolsulphonephthalein.

The definite limitations to the single examination of a specimen of gastric contents at the end of one hour may be summed up as follows (Rehfuss):

1. This point records but one phase in the ever changing cycle of gastric digestion.
2. A large number of observations have shown that this point is by no means the high point or the representative one.
3. Many changes may both precede or follow this point.
4. Many forms of hyperacidity and hypersecretion are entirely overlooked in this way.
5. Delay in digestion may mean that figures at the one-hour point may be doubled at the second hour.
6. No idea of evacuation or the motor function of the stomach can be obtained by this method.

To which the writer would add:

7. This one-hour point often fails to distinguish between a true achylia gastrica and the so-called spurious, or false achylia,

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which can quite properly be termed dyschylia gastrica.*

The author began to employ the fractional method of gastric analysis in July, 1915, first on an occasional patient but very lately as a routine procedure. From this series of seventy personal cases the following are herewith appended as illustrations of the findings by this method. In each case an Ewald test breakfast, with 12 raisins taken the preceding night, was removed with the Rehfuss tube.

Case 1. *Normal gastric findings in a woman, age 44 years.*

Time	Free HCl	T. A.	Lactic Ac.	Mucus	Blood	Stasis
15 minutes	4	8	—	0	0	0
30 minutes	12	26	—	0	0	0
45 minutes	26	46	—	0	0	0
60 minutes	44	64	—	0	0	0
90 minutes	34	40	—	0	0	0
1 hr. 45 min.	20	28	—	0	0	0

Stomach empty.

Case 2. *Achylia gastrica, woman, age 44, under observation since 1909, when five gastric analyses showed anacidity with absent ferments. One analysis in 1912 and one in 1914 showed same findings.*

Time	Free HCl	T. A.	Lactic Ac.	Pepsin	Rennin
15 minutes	0	3	0	0	0
30 minutes	0	3	0	0	0
45 minutes	0	4	trace	0	0
60 minutes	0	5	trace	0	0
75 minutes	0	4	—	0	0
90 minutes	0	5	—	0	0

Stomach empty.

Case 3. *Dyschylia gastrica. Woman, age 29 years. Clinical diagnosis: Pellagra; gastric tetany.*

Time	Free HCl	T. A.	Lactic Ac.	Pepsin
15 minutes	0	4	0	0
30 minutes	0	11	0	0
45 minutes	0	13	—	0
60 minutes	4	13	—	0
75 minutes	18	22	—	present
90 minutes	20	24	—	Present

Stomach empty.

Case 4. *Hyperacidity and continuous hypersecretion. Boy, age 16 years. Clinical diagnosis: Chronic appendicitis.*

Time	Free HCl	T. A	Blood	Mucus	Stasis
15 minutes	11	15	0	0	0
30 minutes	37	40	0	0	0
45 minutes	42	54	0	0	0
60 minutes	58	72	0	0	0
75 minutes	70	83	0	0	0
90 minutes	71	86	0	0	0
1 hr. 45 min.	74	84	0	0	0
2 hours	64	86	small amt.	0	0
2 hrs. 15 min.	68	74	small amt.	0	0
2 hrs. 30 min.	72	76	0	0	0
2 hrs. 45 min.	72	78	0	0	0

(Stomach still secreting; tube withdrawn.)

Case 5. *Hyperacidity and continuous hypersecretion. Man, age 49 years. Clinical diagnosis: Chronic cholecystitis.*

Time	Free HCl	T. A.	Lactic Ac.	Blood	Mucus	Stasis
15 minutes	0	8	—	0	0	0
30 mintes	6	12	—	0	0	0
45 minutes	21	26	—	0	0	0
60 minutes	31	38	—	0	0	0
75 minutes	48	59	—	0	0	0
90 minutes	50	58	—	0	0	0
1 hr. 45 min.	69	73	—	0	0	0
2 hours	71	76	—	0	0	0
2 hrs. 15 min.	78	84	—	0	0	0
2 hrs. 30 min.	80	84	—	0	0	0
2 hrs. 45 min.	76	80	—	0	0	0
3 hours	60	68	—	0	0	0

Tube withdrawn. Stomach still secreting.

Case 6. *Achylia gastrica, malignant. Man, age 39 years. Diagnosis: Gastric carcinoma. X-ray examination showed growth in pyloric antrum without evidence of stenosis. Exploration revealed inoperable mass with metastases in the liver, confirmed histologically.*

Time	Free HCl	T. A.	Lactic Ac.	Blood	Mucus	Stasis
15 minutes	0	1	—	0	0	0
30 minutes	0	4	trace	0	0	0
45 minutes	0	2	trace	0	0	0
60 minutes	0	4	—	0	0	0
75 minutes	0	2	—	0	0	0
90 minutes	0	not enough for titration.				

Case 7. *Hypersecretion and hyperacidity (after 1 hour). Man, age 45 years. Clinical diagnosis: Gastric ulcer. X-ray examination showed constant deformity just proximal to pylorus, no stasis.*

Time	Free HCl	T. A.	Lactic Ac.	Mucus	Blood	Stasis
15 minutes	12	18	—	sl.	0	0
30 minutes	18	28	—	0	0	0
45 minutes	38	44	—	0	0	0
60 minutes	50	58	—	0	0	0
75 minutes	50	58	—	0	0	0
90 minutes	70	80	—	0	0	0
1 hr. 45 min.	88	98	—	0	0	0
2 hours	98	104	—	0	0	0
2 hrs. 15 min.	94	102	—	0	0	0
2 hrs. 30 min.	108	112	—	0	0	0
2 hrs. 45 min.	104	112	—	0	0	0

3 hours. Stomach empty.

*The terms "achlorhydria" and "gastric anacidity" are not exactly descriptive of these partial achylias, and the writer would suggest the term "dyschylia gastrica" in these cases to signify an incomplete or imperfect secretion of gastric juice.

Case 8. *Hyperacidity without hypersecretion. Man, age 56 years. Diagnosis: Duodenal ulcer. Operation showed indurated ulcer, 3 cm. in diameter, on anterior wall of duodenum.*

Time	Free HCl	T. A.	Lactic Ac.	Mucus	Blood	Stasis
15 minutes	10	14	—	0	0	0
30 minutes	38	46	—	0	0	0
45 minutes	42	54	—	0	0	0
60 minutes	62	74	—	0	0	0
90 minutes	70	75	—	0	0	0

Stomach empty.

The writer has been distinctly impressed by the increased information obtained by the fractional method of gastric analysis.

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ARTIFICIAL PNEUMOTHORAX.*

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As the literature on this subject is very complete and is readily available to every one, no attempt has been made to review the history or technic, but this paper is based mainly upon the results obtained in fifty cases which have been treated by this method and discharged from Catawba Sanatorium.

Following an example which recently came to our notice, we are placing the conclusions in the beginning for two reasons: There will be those who are not interested in the subject and who will listen only to the first page, and again those who are interested will more readily follow the paper if the summary is presented at the outset.

CONCLUSIONS.

1. The selection of cases should be carefully made if success is to be expected and the operation be saved from disrepute.

2. In spite of careful examination, including X-ray examination in some cases, we are unable to discover an extensively adherent pleura in a large per cent of cases prior to attempting compression.

3. In the early part of the treatment all cases should be treated as bed patients.

4. In order to accomplish the greatest benefit the lung must be kept completely compressed for a long period of time—how long we are not yet in a position to say.

5. The immediate dangers are relatively slight and may be successfully avoided by proper technic. The remote dangers are chiefly due to embarrassment of the better lung and may often be anticipated and prevented.

6. Artificial pneumothorax offers a chance for great improvement in a class of cases hitherto regarded as very doubtful.

In all of our work we have used the closed or puncture method and although the technic is very simple and easily mastered, the operation is rather tedious until one has seen it done; and no one should undertake it until he has seen it performed, or, better still, until he himself has given at least one refill.

The indications for compressing the lung are:

1. Progressive tuberculosis, with one lung showing relatively slight involvement.

2. Hemorrhage not controlled by ordinary methods.

3. Recurring pleural effusion, serous or purulent.

4. Continuing a spontaneous pneumothorax.

5. Pulmonary abscess.

6. Unilateral bronchiectasis.

In choosing a patient for pneumothorax we must of course first be relatively sure that the condition of the better lung is good enough to do the work of both. It is surprising, however, in some cases how much of the better lung may show rales and yet stand up well and indeed slowly clear in spite of the extra work it performs. Often it is necessary to rest a patient in bed a long time in order to allow the process in the better lung to quiet down before we risk the attempt.

In the presence of severe hemorrhage artificial pneumothorax may be resorted

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to in order to control the bleeding even with extensive involvement in the better lung. In such cases the compression may be kept up for only a few weeks or months as the case may be.

Recurring pleural effusion may at times yield to replacement by air and this is worthy of trial should the effusion continue to recur and produce urgent symptoms.

The indication for continuing a spontaneous pneumothorax is the same as that for instituting artificial pneumothorax.

A pulmonary abscess may at times be emptied and the cavity compressed, but compression should be resorted to early in the disease.

We have had no experience whatever in compressing for bronchiectasis.

The object being to compress the lung as completely as possible and keep it compressed for a very long time, the following contra-indications might be mentioned:

1. Dense or extensive pleural adhesions.
2. Cavitation with rigid walls.
3. Inability or unwillingness on the part of the patient to co-operate in the treatment.

There is no means by which we can discover pleural adhesions in some cases until we insert the needle and fail to secure a pleural space. In 16% of our cases no space could be located in spite of numerous attempts in different regions.

Surrounding cavities superficially located we often find dense adhesions. Therefore, it follows that greater success will be met in compressing cases in which the process is located in the upper part of the lung. It is very general also to encounter dense adhesions in those cases in which a pleural effusion has been absorbed. We should, therefore, in choosing the site for the puncture avoid regions of marked dullness or of evident cavity formation. At times, however, we have been pleasantly surprised to encounter a relatively clear pleural space in cases showing very extensive and advanced involvement.

Should the walls of a cavity be sufficiently rigid to resist collapse, the good effect of pneumothorax may be impossible of attainment. No such case has occurred in our series so far as we are aware, but as we have no X-ray at the Sanatorium we can not be sure. However, failures of this nature are reported by several writers and the condition should be borne in mind.

One of the cases in which an excellent result was obtained shows only a very small partial pneumothorax at the base; sufficient, however, to completely obliterate all physical signs of a large cavity in the upper lobe.

A lack of intelligence on the part of the patient may constitute a serious contra-indication. For the first few weeks at least, and often for months, the patient should, we think, be treated as a bed patient. By so doing the risk is lessened and many doubtful cases may be successfully treated in which otherwise the attempt must be given up. Some of our early failures may be fairly attributed to allowing the patient to be up and about or to a lack of co-operation on the patient's part, and a failure to carry out instructions as to rest. To obtain the best results the lung must be kept collapsed over a protracted period and the state of the pocket book must also be taken into consideration, for if the patient lives at a distance from a physician doing this work he may not be able financially to continue it.

Compression of the lung apparently brings about improvement in the following way:

1. The lung is held firmly compressed and all motion prevented, thus insuring absolute rest.

2. The size of cavities is reduced and the walls more nearly approximated, the contents of cavities as well as the contents of the bronchi being emptied, thus minimizing the danger of aspirating infectious material into uninfected regions.

3. The lymph circulation is limited and probably the blood circulation as well, thus lessening absorption as shown by lessening toxicity of the patient.

As a result of this compression the diseased area heals more rapidly, as has been shown in autopsy findings by Graetz of Brauers clinic, Forlanini and others. The increased amount of fibrous tissue and cicatrization was a striking finding both in the region of cavities and along the course of the vessels and bronchi. In addition recent tubercles were rare in the

compressed lung. These contained few bacilli and no giant cells. The pathological changes in the compressed lung are slow of occurrence and seem to be in direct ratio to the length of compression.

In favorable cases there is a gradual improvement in the patient's general condition. The expectoration, although increased at first, as might be expected, often quickly becomes reduced in amount, and the character changes from purulent to whitish. The cough becomes lessened and often in unilateral cases both cough and expectoration disappear entirely in the course of a few weeks. The pulse and temperature gradually return to normal and the appetite and digestion both improve rapidly.

In the case of hemorrhage the result is spectacular. Bleeding stops at once and does not recur, and improvement in many of these cases is rapid.

The weight in some cases declines, even though the patient otherwise shows marked improvement. But in others there is a steady gain in weight from the beginning of treatment.

The improvement in the general condition will often bring about improvement in the process of the non-compressed lung in spite of the additional work it is called upon to do. This is accounted for by the lessened amount of toxin in the general circulation and the flooding of the lung by blood richer in immune products.

Complications such as tuberculosis of the larynx and intestines have proven not to be contra-indications, but have improved as the general condition improved. In one of our cases the better lung showed extensive involvement, but this has gradually lessened in extent in spite of the fact that this patient has only one kidney as a result of the removal of a tuberculous kidney one year before pneumothorax was commenced.

Another case was in wretched general condition, with a badly ulcerated larynx, marked symptoms of intestinal involvement, and a moderate involvement of the upper lobe of the left lung in addition to far advanced involvement of the entire right. The right lung was successfully collapsed and kept collapsed for nineteen months. At the end of this time he left the Sanatorium still showing moisture in upper half of upper left, but having had no symptoms whatever for more than six months and a larynx apparently entirely healed. Since leaving us this lung has been allowed to re-expand, four months since, but we understand that he is continuing to improve.

The dangers of the operation are not very serious if proper care be taken. By the use of the manometer air embolism may be avoided, and by careful and complete anesthetization of the parietal pleura a pleural shock may be avoided. We did not fully realize the importance of this until we had pleural shock in two cases from hurried work, nor did we appreciate the importance of not causing pain as an inducement for the patient to continue treatment.

Infection from without may be avoided by surgical cleanliness. One of our effusion cases became infected, requiring resection and drainage. This was a case of spontaneous hydro-pneumothorax which was aspirated and the fluid replaced by air. The effusion continued to accumulate in small quantities and after thirteen months the fluid became purulent and we were forced to resect. The pus, however, was sterile on culture.

Effusion is not at all uncommon and is more frequent after the lung has been compressed many months. An effusion of small amount is of no moment and a large number of our cases have several times during treatment had slight effusions and absorbed them. Only four cases have shown effusions large enough to produce urgent symptoms and require aspiration. However, we do not now advocate leaving an effusion to continue compression, but rather advise aspiration and replacing by air. This view we hold after seeing four other cases absorb the effusion with consequent formation of dense pleural adhesions, preventing further continuance of compression. Three of these cases have already died and the fourth is progressing rapidly.

A serious complication arising in two of our cases is rupture of a partially collapsed lung, converting the case into a spontaneous pnuemothorax. In one of the cases, a pulmonary abscess which proved fatal, we were forced by urgent symptoms to aspirate air and relieve pressure, and

in the other to aspirate both air and fluid. This latter case improved slowly and is now doing well, the lung being compressed by a large effusion.

A most serious occurrence and one for which we must continually be on the watch is a flare-up or extension of the process to the good lung. In six of our cases we were forced to abandon compression on this account. One of these cases died in the Sanatorium from a bronchopneumonia, and the other five have died since being discharged. However, we have seen many cases showing a slight flare-up, which required only a lessening of pressure and additional rest to enable them to continue the treatment. Our observation leads us to believe that it is unwise to attempt compression in cases having a basal lesion in the good lung. The earliest evidence of embarrassment in the good lung is usually the occurrence of very fine moisture in the base. This warning was not sufficiently appreciated earlier in our work, but we now feel that it is a sign of real danger and that it demands a lowering of pressure in the compressed side in order immediately to lessen the embarrassment of the non-compressed lung.

In this connection reference should also be made to the importance of using the lowest possible pressure throughout the treatment, but especially for the first few months.

Below is inserted a summary of the fifty cases:

SUMMARY OF FIFTY CASES.

	Cases	Per Ct. Total
No compression obtained in	16	32
Partial compression obtained in	7	14
Complete pneumothorax	27	54
16 cases in which no compression obtained were discharged as		
Improved	7	14
Progressive	6	12
Died	3	6
Present condition		
At work (part time)	2	4
Improving	4	8
Progressive	2	4
Died	8	16
The 34 cases in which pneumothorax was obtained were discharged as		
Improved	25	52
Progressive	7	14
Died	2	4
Present condition		
Returned to work (5 discontinued treatment after average length of compression 22 months)		
5 continuing, average length compression 28 months	10	20
Flare up of good lung and gave up work temporarily	1	2
Continuing treatment and improving, but not at work including the case which failed at work (average length of compression 21 months)	12	24
Discontinued treatment and improving, but not at work	1	2
Discontinued treatment and failing	2	4
Lost (returned home to Italy)	1	2
Died since discharge	6	12

As will be seen by reference to the above tables, the results obtained in the 34 cases in which pneumothorax was secured, including the partial cases, are infinitely better than in the 16 in which no compression was obtained. This is a fair comparison, for the cases were all far advanced and we have carefully weighed the condition of both classes of cases. If there be any difference it is slightly in favor of the non-compressed cases.

An improvement in 26 of a total of 50, or 52%, of far advanced cases with a full restoration of working capacity to 10 or 20% is no mean result. If we consider only those cases in which pneumothorax was obtained, 38% were restored to working capacity. One of these cases has married, successfully given birth to a child, and is still doing her own work and improving.

We must not become too optimistic, however, for it is only a few of the far advanced class which are suitable for this form of treatment, and in a fairly large per cent—32% in our series—the pleural space has become obliterated and no compression can be obtained.

Again, in 14% no improvement was secured; and 4% died. Since discharge 12% have died, making a total of 14, or 28% of the cases.

In conclusion, we should like to advise against the indiscriminate use of pneumothorax. While the results obtained by its use are remarkable in many instances, at the same time the failures are also very noticeable and the possibilities for harm are great unless great care is used in choosing the cases and continued careful watch is maintained over the patient throughout the whole course of the compression.

Discussion of this paper will be found following next paper.

THE APPLICATION OF ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF PULMONARY TUBERCULOSIS.*

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The artificial pneumothorax treatment of chronic pulmonary disease is not a new one and is not so presented at this time, but it is the only treatment of pulmonary tuberculosis developed in the last decade that stands the test of time. It is not a *cure* as that term is generally accepted. It is a *treatment* that has been successfully applied to cases of otherwise hopeless consumption, and, as such, constitutes a subject which should be known to, and appreciated by, all interested in the alleviation of those suffering from that insidious disease.

Carson's announcement in 1821 that in his experience the compressing of a tuberculous lung by a pleural effusion or a spontaneous pneumothorax had been conducive to the healing of that lung, found an echo from time to time in the half century following, in the manuscripts of Houghton, Stokes and Adams. But not until 1882 was the physiological principle involved brought into practical use through artificial but scientific means. In that year Forlanini, of Pavia, began to compress lungs with chronic disease by means of atmospheric air introduced into the pleural space by a needle from without, and in 1895 he reported a series of cases treated with more or less success. In 1898 John B. Murphy, of Chicago, uninformed of Forlanini's work, reported a series likewise treated. It was not until 1910 when Professor Saughmann, of Copenhagen, added the manometer to the apparatus used, that the proceduce became a safe one and was utilized subsequently by clinicians throughout the tuberculosis world.

As yet no one has done any work to show that the good results in the lung treated by the compressing gas is due to more than the physiological rest produced. In other words, this is a mechanical treatment analagous to the application of the plaster cast to the broken bone to immobilize it. Subsequent to the rest come lessened absorption of toxins, decreased symptoms and local healing.

The whole subject may be considered conveniently under the following comprehensive headings: Selection of Cases, Technique of the Inflation, Subsequent Inflations, Duration of the Collapse, and Anatomical and Clinical Results.

SELECTION OF CASES.

Upon the selection of cases depends to the greatest degree the ultimate success of the treatment, and it is upon this point that we find the closest harmony of opinion among the operators. Otis says the treatment is indicated in advanced or advancing cases of tuberculosis which do not yield to ordinary treatment and when the disease is practically unilateral. Knopf and Lapham say uncontrollable hemorrhage or chronic hemoptysis should also be treated by this method. Gray suggests that one should not wait until all other means of treatment have failed. Murphy selects advanced unilateral cases. As the application of the method has extended, operators seem to be selecting cases in the earlier stage rather than waiting for the disease to become advanced. We agree that the unilateral cases offer the best chances for success. Four years ago Hamman and Sloan made the observation that while induced pneumothorax would be of inestimable benefit to a large number of patients, it would never become a routine treatment of chronic pulmonary tuberculosis,—a statement based upon the scarcity of unilateral cases of the disease sufficiently advanced in the one lung to justify such a radical procedure. This observation has become a conviction after four years' additional experience. The author feels that the best and most convincing results will be obtained in the early moderately advanced cases. Even the early moderately advanced cases should not be subjected to the method until after recourse to the universally prescribed hygienic-dietetic regime, and in some instances tuberculin treatment, unless some urgent indication such as uncontrollable hemorrhage be present.

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We have selected as suitable for the treatment patients showing:

(a) Gross and active lesions in one lung with a quiescent lesion not extending below the level of the fourth rib in the other lung;

(b) Gross and active lesions in one lung with a mildly active lesion not extending below the level of the third rib in the other;

(c) Quiescent lesions, bilateral but suitably located, with a history of aggravating cough and profuse expectoration;

(d) Arrested lesions, but with a history of recurring hemorrhages; and

(e) Arrested, but suitably located lesions, with a previous history of relapse whenever work was attempted.

We have designated as unsuitable, patients showing:

(a) Gross and active lesions extending below the level of the third rib on both sides;

(b) An extensive gross lesion in one lung and a lesion located at the base in the other;

(c) Serious complications, such as cardiac disease, marked arterio-sclerosis, ulcerative laryngitis, chronic diarrhea, extensive tuberculous ostitis, and nephritis, either acute or chronic;

(d) Disease apparently of long standing, as shown by marked fibrosis of the lungs, thoracic deformities, decided cardiac displacement and dyspnea;

(e) A history of chronic alcoholism;

(f) A history of recurring hemorrhage from both lungs;

(g) A marked emphysema;

(h) An erratic and excitable temperament; and

(i) Real or apparent old age.

Special indications for treatment in this series were:

Case III was having repeated small hemoptyses from the left lung over a period of sixteen months, in which time the patient had had five months' sanatorium treatment;

Case V had an enlarging cavity in the right lung, which was already partially compressed by an extensive pleural effusion on that side;

Case IX gave a history of frank hemorrhages from the right lung occurring over a period of eleven months.

Case XI gave a history of hemorrhage from the right lung occurring over a period of eleven months which had not been permanently relieved by forced rest in bed and the usual treatment for such a condition;

Case XII was developing a cavity in the upper lobe of the right lung and was having small hemoptyses from that region;

Case XIII showed constant progression of tuberculosis in the right lung with hemorrhage from that area in spite of sanatorium treatment in the East and two years' residence in the far West;

Case XVI gave a history of profuse hemorrhages from the right lung occurring over a period of seven months; during the seven days prior to first inflation this patient, while in a hospital in Baltimore, lost by conservative estimate 1600 cc. of blood; he was having a hemorrhage at the time of inflation;

Cases XIX, XXX, XXXII and XLIII had had repeated hemoptysis;

Case XXI was one of bronchiectasis with hemorrhage from the right lung;

Case XXII had had repeated attacks of fibrinous pleurisy in the right side, causing sharp pain, cough and shortness of breath; and

Case XXXIII showed rapid extension of disease in right lung with cavity formation in upper lobe.

All of these patients had apical lesions in the opposite lung. Cases of the series not especially mentioned were treated for slow extension of chronic ulcerative tuberculous lesions which were considered suitable for lung compression. It is noticeable that hemorrhage was the predominating indication for treatment in this group, and probably is in all groups, as it represents a concrete demand for relief and as such needs no associated symptoms for persuading the patient to submit to the procedure.

Too much emphasis can not be placed upon the need of the lung which must do the work of both during the compression of one, being entirely free of any active disease below the level of the third rib or of a basal lesion of any size. The question is not how extensive the disease is in the lung to be treated, but how little involvement of the better one. The following represents an ideal candidate: Case XXXIII. In the Spring of 1913 the patient developed what was diagnosed typhoid fever. He slowly recovered from this, but on attempting to work had a relapse. The diagnosis was later changed to malarial fever. The patient felt tired and lost weight and in September had night sweats, an increase in cough and afternoon headaches. Examination October 7, 1913, revealed pulmonary tuberculosis of the moderately advanced stage. The lungs showed: Right: dullness to rib

4 and over the whole back, except in the suprascapular fossa, where it was apparently resonant; amphoric breathing from 5th to 6th thoracic spines; bronchophony in the same area and between ribs 2 and 4 in front; rales over whole side, especially along the base front and back. Left: impairment to rib 2 and to thoracic spine 5; whispered voice harsh above and below clavicle and in upper interscapular area; high pitched expiration below clavicle. Heart: normal, except for hemic murmur accompanying the second sound. No complications. Sputum positive for tubercle bacilli. Patient was kept constantly in bed for eighteen days, during which time his afternoon temperature ranged from 100 to 102° F.; he was dyspneic; his appetite was poor; his cough was bad at night; and he was decidedly toxic. There was little involvement at the apex of the left lung, but a large cavity increasing in size in the upper right lobe was undoubtedly jeopardizing the patient's future.

A noticeable lack of favorable results has been obtained in habitual alcoholics who on the whole co-operate poorly. It is unreasonable to expect satisfactory results in those who will not co-operate.

Case XXVIII is a typical one. Patient became weak and short of breath in August, 1912; night sweats and cough later developed. He had been a regular drinker for the past twelve years, taking from three to ten drinks of whiskey and beer per day. Examination showed moderately advanced pulmonary tuberculosis with the lesions suitably located for lung compression. Treatment of left lung was begun March 22, 1913, after four months' observation in the Sanatorium. Symptoms diminished and temperature slowly became normal. His pulmonary disease was undoubtedly better, but his general condition did not improve so fast as was reasonable to expect. In August it was discovered he was drinking as much liquor as he could get his friends to bring him and was slipping off for a long walk to a saloon when the opportunity presented. He was discharged from the Sanatorium August 30, 1913, and later died in another institution.

Case II was one of poor selection, the treatment being given for sentimental rather than for scientific reasons. Enthusiasm and sentiment must be leavened with judgment and common sense. This patient had chronic pulmonary tuberculosis of three years' duration; extensive involvement of both lungs, the lesion in the right being active and extending to the fourth rib in front and to the seventh thoracic spine in back; the lesion in the left involved the whole lung and a large cavity occupied the upper lobe. First inflation was made June 29, 1911. There was some decrease in cough and expectoration and a temporary reduction of fever, bringing gratifying relief. But the heart and the mediastinum were pushed completely to the right of the sternum and the encroachment upon the right lung and the greater work placed upon it aggravated its lesions. Inflations were discontinued August 9th. The disease continued active and the patient died January 6, 1912.

A flexible mediastinum, though not a contra-indication to continued treatment, is an obstacle to best results.

TECHNIQUE.

Prior to the advent of the manometer, Brauer, of Hamburg, devised a technique in which he bluntly dissected down to the pleura, lifted the parietal layer and introduced a blunt needle into the pleural space. This technique was a safeguard against gas embolus and was an improvement on the Forlanini-Murphy method, which consisted of introducing a lumbar-puncture needle straight through the skin, muscles and fascia until the sound of inrushing air indicated that the fenestrum was in the pleural space.

The generally accepted technique today is as follows: The site for introduction is sterilized with an application of tincture of iodine, the excess being removed later with alcohol. The path of the needle is infiltrated with a 2 to 4% solution of cocaine or novocaine. The skin and subcutaneous tissues are punctured with an iridectomy knife and a lumbar-puncture needle is introduced into the wound. It is guided through the deep tissues into the pleural space by the thumb of the left hand, which is placed firmly in the intercostal space. The sixth intercostal space in the midaxillary line is the writer's site of choice, though some prefer the ninth interspace in the mid-scapular line. The needle all the while is in direct communication with the manometer, which responds sensitively to the various pressures at the needle's fenestrum. The manometer shows by its oscillations when the eyelet is in the subpleural space, the pleural space, a blood vessel, a bronchus or lung tissue. It also indicates the presence of adhesions, a localized pleural space, a free pleural space, a flexible mediastinum, the presence of fluid, the diffusion of gas into a bronchus, or if there is an obstruction in the needle or rubber tubing of the

apparatus. Considering the danger of embolus accompanying the introduction of gas, satisfactory oscillations of the water column indicating the presence of the needle's fenestrum in the pleural space are absolutely essential. The oscillations indicating this situation are free and synchronous with the respiratory movements of the chest. The water column responds sensitively to a deep inspiration or a forced expiration, and the column can be held at any point on the scale by the patient's holding his breath. The amplitude is usually about 50 m.m. and seldom does it include in its bounds the zero line, but is confined to the negative side of the line. The spasmodic uncertain oscillations, uncontrollable by the patient's voluntary movement of his chest, are misleading and should always be a contraindication to the introduction of gas. It is obvious that the tubing and needle must be entirely free of serum, water or any other agent which might interfere with satisfactory oscillations. An amplitude equally divided by the zero line indicates neutral pressure and that the needle is in direct communication with the outside air through a bronchus. A slowly increasing positive pressure without oscillations usually indicates that the needle is in a blood vessel and with the tubing is becoming filled with blood. A markedly positive pressure upon expiration, with a small negative reading upon inspiration, indicates that the needle is in a pleural space walled in by adhesions. If the pressures quickly increase upon the introduction of a small amount of gas and remain high, the needle is probably in lung tissue. The problems and dangers of the technique are practically all co-incidental to the initial inflation and are much simpler or are eliminated altogether in subsequent inflations. The gas formerly used was nitrogen, but since the convincing experiments of Webb and his associates sterile atmospheric air is used by a majority of clinicians. The gas is allowed to flow in slowly and readings are made after the introduction of each 100 cc. The patients of this series as a rule received 500 cc. during the initial inflation, which was followed by a like amount every three days until three inflations were given. These small amounts frequently repeated in the early stage of compression are recommended, as they better enable the untreated lung, heart, and other adjacent organs to readjust themselves to the radical changes being produced in the respiratory system.

In cases treated for hemorrhage from 700 to 1,000 cc. were given to create quick, firm pressure against the bleeding points.

Accidents during inflation mentioned in the earlier publications on this subject have occurred with less frequency with the perfection of the technique. Pleural shock, due to the irritation of the pleura by the needle and superinduced by insufficient cocainization, is manifested by fainting of more or less intensity, cyanosis, dilated pupils, cold, clammy skin, and sometimes vomiting. The author has experienced two cases of pleural shock, both occurring during initial inflations. Case XVI, mentioned earlier in this article, had been considerably weakened by the loss of 1,600 cc. of blood in the seven days preceding the initial inflation. As the needle touched the pleura the patient complained of pain at the site of introduction and became unconscious. His pulse was weak and rapid, and his skin was cold and pale; and the pupils became dilated. As he was having an otherwise uncontrollable hemorrhage at the moment, it was agreed to continue with the treatment. Hot water bottles had already been applied to the extremities, and one quarter grain of morphia and one-thirtieth of strychnia were given hypodermically. Five hundred cc. of gas were introduced. After five minutes of unconsciousness, which seemed to stretch into hours, the patient became rational and asked for a drink of water. Save for blood-streaked sputum during the following night, he lost no more blood for over six months. We might add parenthetically that the subsequent hemorrhage came from a consolidated area in the treated lung which could not be compressed and was brought about by indiscretions after the patient had left the Sanatorium. Gas embolism is an accident mentioned by different writers, but for which there seems to be little excuse when proper deference is shown the manometer. Pulmonary infarct results from puncturing the lung and is due to careless technique in most instances. Infection of

the pleural space from without may occur, or from the puncture of an ulcerated area of lung resulting in contamination when the needle is subsequently withdrawn. Cardiac dilatation has been reported and probably is due to the too hasty collapse of the lung. Dyspnea frequently results and is due to the introduction of too much gas. Pleural effusion is not an infrequent complication. It occurred in six cases of this series. It has no bearing upon the degree of compression nor upon the stage of treatment. It sometimes appears early and again after inflations have been discontinued. Though it is usually due to an infection either exogenous or endogenous, there are instances when it appears to be the result of mechanical irritation of the pleura or torsion of the lymphatics. The dangers of pleural effusion are thickening of the mebrane preventing the restoration of lung function, and subsequent infection by a pus organism from within or without, producing a pyo-pneumothorax with its distressing symptoms and frequently untimely termination. Two of the most successful cases of this series developed fluid early in the treatment, but both treated lungs are functioning today, two and three years, respectively, after treatment was discontinued. Hemorrhage from the opposite lung results from placing too much work upon a diseased area in that organ. Subcutaneous emphysema due to intrapleural hypertension is quite a common complication, but not a serious one.

The amount of gas to be introduced during the initial inflation depends upon the exigency of the case. As has been said, hemorrhage demands immediate control and a sufficient amount of gas must be given to obtain compression upon the bleeding point. If the indication for treatment is the slow progression of the lesion and no appreciable activity exists below the level of the third rib in the untreated lung, 700 cc. can be given with impunity during the initial inflation. If activity exists below the third rib in the better lung, 500 cc. will be a safer amount. Subsequent amounts introduced vary from 400 to 800 cc. given every four to seven days until the desired amount of compression is obtained.

Adhesions prevent permanent results in a large number of cases treated. Basal adhesions are such as frequently to prevent the introduction of gas even in the smallest amounts. In five cases of our series it was impossible to locate a free pleural space, though from six to eleven punctures were made in different areas of the hemithorax.

SUBSEQUENT INFLATIONS.

No absolute rule can be laid down governing the amount of gas to be given or the length of intermissions between subsequent inflations, owing to the lack of uniformity of lesions among patients. One is guided by the terminal pressures of the preceding inflation, the estimated amount of gas absorbed since the previous inflation, the character of the pulse and temperature curve, the effect upon weight, cough and expectoration, pains produced by the gas, but above all, by the physical condition of the working lung. The character of the rales along the lower border of the lesion in the working lung must be watched carefully. It is a safe rule not to compress the lung completely in less than four weeks' time. After obtaining complete compression, 600 to 900 cc. every two to three weeks will suffice to maintain it. Inspiratory pressure of plus 20 mm. and an expiratory pressure of plus 40 mm., making an amplitude of 10 mm., make a desirable stopping place for the individual inflation. Gas forced in under gentle pressure is sometimes employed to separate recent adhesions, but this is risky. Mobility of the treated lung is gauged by the width of the amplitude; the smaller the amplitude, the less the expansion, adhesions being absent. It is undesirable to attempt to obliterate the amplitude in case of a freely movable mediastinum. The physical signs in Case XXXIX were those of a complete pneumothorax. These signs were obtained as far as the parasternal line on the opposite side in front and beyond the vertebral column in back, showing a complete displacement of the mediastinum and consequent encroachment upon the working lung. The amplitude varied from 60 to 80 mm., extremely wide, but it would have been dangerous to attempt to decrease it. It is unsafe to keep the lung completely collapsed with such a movable mediastinum. Our experience makes us feel that satis-

factory ultimate results can be obtained without keeping the lung completely collapsed. Symptomatic results, such as reduction of temperature, cough and diminution of expectoration, are noticeable in most cases while yet a partial compression exists.

DURATION OF COLLAPSE.

It is exceedingly doubtful if healing in the lung sufficient for the organ to resume functional activity with any degree of safety can occur in a shorter time than two years. In Case III the lung was kept compressed for a year, when the patient was pronounced clinically well and the treatment was discontinued. Four months later, when re-expansion had become complete, signs and symptoms of activity reappeared in the upper lobe. Nine attempts were made to recollapse the lung, but everywhere the pleura was found to be closely adhered. The same condition has been encountered in a number of other cases and other clinicians are reporting the same discouraging experience. The gas acts as a foreign irritant predisposing the pleural surfaces to adhesions which render impossible recompression in the majority of cases if such become indicated. In the absence of contra-indicating symptoms, such as shortness of breath and loss of weight, and if the patient is comfortable and be not inconvenienced, the author recommends that inflations be continued for from two to three years.

RESULTS—ANATOMICAL AND CLINICAL.

By reason of its sound physiological basis is the status of the treatment established, and failure to produce results in a given case must be attributed equally to poor selection by the operator as to the procedure per se. Even allowing for the vagaries of human judgment, the method offers the encouraging prospect of temporary and even permanent relief to a number of patients who otherwise would be doomed to suffer with a hopeless chronic disease. That healing is promoted and hastened by the prolonged rest is testified to by the similarity of pathological findings of those who have had the opportunity to study a large number of necropsies, as Forlanini, Saughmann, Bruns and Graetz. Bruns says: "Histological examination of collapsed lung showed extensive atelectasis. Alveoli contained no air. The alveolar walls touched, but had not grown together. The epithelium remained intact and the lung might have been successfully reinflated. In the bronchi no inflammatory reaction was seen. Thickening of connective tissue of the bronchial walls and septa was seen and was most probably due to stasis of the blood which remained venous. Not only is the tendency created for healing in the diseased lung, but also for formation of connective tissue and encapsulation of tuberculous foci."

Concomitant with the elimination of toxins formerly absorbed from the gross lesions of the treated lung, signs in the untreated lung become decidedly lessened and in many cases become those of a healed lesion. McKeon, of this country, in the following abstracted necropsy report, gives a clear portrayal of the radical changes found in a chest cavity after treatment of three months:

"*Necropsy Abstract*—Upon opening the thorax the right lung was seen to be almost completely collapsed and flattened against the vertebral column, occupying a space in the middle of the pleural cavity about six inches wide and two inches thick and extending from the dome of the liver to a point directly below the clavicle. There were eight distinct bands of adhesions, extending from the front and side of the chest wall, varying in length from two to six inches; they were stretched tightly and upon being cut retracted. Upon incising the lung in situ the knife entered easily; the lung tissue was congested; the tissue presents an appearance not greatly different from that of normally congested lung. The upper and middle lobes are infiltrated throughout; there is a cavity five centimeters in diameter in the lower portion of the upper lobe, the walls of which are approximated. At the apex the adhesions existed in three or four bands, which had apparently stretched to the length of two inches. The lower lobe seems to be free from gross tuberculous lesions. There was a small serous effusion of about 150 cc. in amount."

Symptomatic benefit is not long in forthcoming in the well selected patients. The first effect usually noted is the reduc-

tion of fever. Temperature formally ranging from 100 to 102° F. in the afternoon may assume a normal course within a week. Cough and expectoration at first aggravated become negligible. Body weight usually diminishes at first, but later increases and sometimes exceeds the normal. Pain occurs in the chest in proportion to the number and extent of adhesions in the treated pleura. The patient sometimes suffers with insomnia in the early stages of the treatment. Tubercle bacilli may, but do not always, disappear from the sputum. The good effects and their permanency, as to be expected, are proportionate to the suitability of the patient for the treatment.

A synopsis of the results in a series of forty-eight cases of the author is as follows: Adhesions were so extensive in five patients that it was impossible to inject any gas. In these from three to eleven efforts were made in different areas without results. In Case V the Brauer method was tried unsuccessfully. Adhesions were so numerous as to permit only a partial collapse in twenty-three cases. The adhesions were confined to no particular area and the lower lobe was collapsed as frequently as the upper. A free pleural space was found and a complete collapse obtained in twenty patients. Owing to an unusually flexible mediastinum permitting encroachment upon the working lung and causing cardiac displacement, it was considered advisable to maintain only a partial collapse in three of these in the course of the treatment.

Of forty-eight moderately and far advanced patients treated from three months to four and a half years, twenty-three, or 48%, have died, and twenty-five, or 52% plus, are living. Of these twenty-five living, ten, or 21% plus of the whole, are doing poorly; fifteen, or 31% plus, are doing well and are working part of the time. Some of these are inclined to resume their former full working time, but refrain on medical advice. Eight, or 17% plus, have resumed all of their former business and social obligations. Five, or 10% of the whole, have been working without symptoms for nearly three years.

"Common Sense and the Fever Thermometer vs. the Stethoscope and Microscope in the Diagnosis of Early Pulmonary Tuberculosis," by Dr. Sam E. Thompson, Carlsbad, Texas; "Rest and Exercise in Tuberculosis," by Dr. Thompson Frazer, Asheville, N. C.; "Bronchial Gland Tuberculosis," by Dr. Mary Lapham, Highlands, N. C.; and "The Recognition and Treatment of Occult Tuberculosis," by Silvo von Ruck, Asheville, N. C., read as part of the Symposium on Tuberculosis and discussed below, were printed in the July issue of the JOURNAL.

DISCUSSION: SYMPOSIUM ON TUBERCULOSIS.

Papers of Drs. Thompson, Frazer, Lapham, Von Ruck, McBrayer and Sloan.

Dr. Robert B. Homan, El Paso, Tex.—In the first place, I desire to thank most heartily the committee who selected the essayists for this program. To me it has been one of the most interesting symposiums of the whole meeting of the Southern Medical Association. The subjects selected have all been of practical value.

The most important phase of the subject of tuberculosis is early diagnosis, and I believe that the most important paper that has been presented here is the one by Dr. Thompson, who has so ably covered that subject. Certainly, early diagnosis is the key to the successful treatment. When the profession at large learns to discover tuberculosis in the lungs in the stage which Dr. Thompson has tried to direct you to discover it, then, and not till then, will you be able to cure a large percentage of those affected with the disease.

Rest and exercise in the treatment are most important. Dr. Frazer has ably presented that phase. Any patient with an active tuberculous lesion should be put absolutely at rest. After the general symptoms have passed away, modified exercise, properly observed and properly regulated, is quite important to bring the patient back to the normal general condition.

Dr. Von Ruck has presented to us a very classical paper upon a subject of great importance in connection with this disease, and one of which we will hear more in the future. This opens a subject which is yet almost unknown to us. In years to come doubtless we will know that occult tuberculosis is always present in many diseases where we do not detect it. Much will be done and is being done along the line of occult tuberculosis. Many cases of tuberculosis are not discovered because they are obscured by the symptoms of other diseases. In time this will be worked out, and we will have much more success in determining those who have tuberculosis and its treatment.

Dr. W. J. Durel, New Orleans, La.—After studying the physical findings and symptoms of pulmonary tuberculosis, we can not say that any of them is pathognomonic of the disease. The granular breathing, etc., dry and moist rales, and the subjective symptoms are often found in other pulmonary affections, such as localized influenza, pneumococcic and coccic infections, and in some non-infectious conditions. The above diseases often show the same physical findings and symptoms that we depend upon for a clinical diagnosis of pulmonary tuberculosis. The presence of tu-

bercle bacilli in the sputum is the only evidence of open pulmonary tuberculosis. However, only 40% of incipient tuberculosis cases show tubercle bacilli in the sputum. We are left, therefore, in 60% of cases with the tuberculin tests as the only corroborative evidence of the presence or absence of tuberculosis in the body when bacilli are absent in the sputum. Approximately 10% to 25% of the cases we see in the Tuberculosis Clinic Hospital in New Orleans, with physical findings and symptoms simulating tuberculosis, prove to be non-tuberculous. During the past two years in the Charity Hospital wards for advanced tuberculosis we have had a number (twenty or more) cases transferred from other departments, which proved after careful clinical and laboratory study not to be tuberculous. We were able positively to corroborate our diagnosis (non-tuberculous) by autopsy in five cases. In the other cases (not autopsied) subsequent observation proved that they were not tuberculous. If non-tuberculous pulmonary conditions are thus mistaken for far advanced tuberculosis, what can we expect to find upon the analysis of incipient tuberculosis.

As for rest in tuberculosis, I expressed my views upon this subject in the meeting at Lexington, Ky. I say now, as I said then, "Rest first and above all; exercise only when all indications for rest have subsided."

Bronchial gland tuberculosis has not been properly understood and recognized in the past. The paper of Dr. Lapham is very interesting and I hope will stimulate others to recognize this condition in time, as it has been my belief for years that bronchial gland tuberculosis precedes pulmonary tuberculosis for months and even years, in a large number of cases the X-ray not always indicating tuberculosis of the gland.

As for artificial pneumothorax, it has no doubt found its place in the therapeutics of progressive tuberculosis, and especially in abscess cases, although we had some disappointment in three cases of the forty compressions. Six cases have improved so markedly that it would be unjust not to claim a proper value for this method of treatment. Other methods of treatment should not be overlooked even though we use artificial pneumothorax.

Dr. I. S. Kahn, San Antonio, Tex.—In speaking of Dr. Lapham's paper, I consider it one of the most important that has been read this morning. This question of bronchial gland tuberculosis is of more than academic interest. We have any number of sub-standard children in whom no active disease can be found. A large number of these cases show positive Von Pirquet reaction, indicating tuberculous disease of more or less recent origin somewhere. X-ray pictures of the chests of these children invariably show unsuspected tuberculous involvement of the bronchial glands, even without evidence of disease of the cervical glands giving us an anatomic basis for our positive tuberculin reactions. Recognition of this condition permits of its correction. Non-recognition will be followed by, in a great many instances, active tuberculosis in adult life. I have to show here this morning a few X-ray pictures which were taken in cases of this kind, where the institution of anti-tuberculous treatment has been followed by excellent clinical success.

Dr. J. W. Laws, Lincoln, N. M.—I would emphasize one point of practical importance to the public. The public and many practicing physicians have not come to the realization of the fact that nearly all of us have been infected at some time or other with tuberculosis and that most of us have latent tuberculosis. One authority states that of 97 autopsies performed upon patients who died from other causes than tuberculosis, all showed evidence of having had tuberculosis.

Latent tuberculosis should give us little concern, but the importance of detecting the early symptoms of active tuberculosis can not be emphasized to the public too forcibly for the reason that the early incipient cases of tuberculosis recover by prompt adoption of rational methods of treatment, while the far advanced cases ultimately succumb to the disease.

It is the common experience of physicians who specialize on tuberculosis to have the patient, who is being examined, or the relatives of the patient, ask the question: "Where did this infection come from? My family record does not show any history of tuberculosis, and I know of no place where it may have been contracted."

This is the wrong idea. The public must be taught rather to think of the time and place where they lowered their vitality and resistance to the infection that they already have, which broke down their immunity and caused the development of active tuberculosis.

Fathers and mothers must be brought to realize that their children are infected with tuberculosis in childhood, and that if the dosage of such infection is small, such an infection is to their advantage in that it produces immunity against the disease in later years. That, however, such immunity may be broken down by improper living, overstudy in the crowded courses of our present schools and colleges, and from undue stress of life which may devolve upon them when they come into adolescence.

Dr. William L. Dunn, Asheville, N. C.—We have had such a wealth of material presented to us this afternoon that it is almost impossible to know where to begin and where to stop.

I wish to thank Dr. Thompson particularly for bringing out the importance of not jumping on the general practitioner who is made the butt of ridicule because he may have failed in making the diagnosis. We not infrequently jump on the general practitioner for late diagnosis.

One point along the line referred to by the last speaker, that everybody has or has had tuberculosis at some time. There is a difference between the "normal" amount of tuberculosis and that which is clinical tuberculosis. Of the physical signs of early pulmonary tuberculosis, there are none. There is no such thing as a physical sign of early tuberculosis. The diagnosis must be made largely from the history, and more careful history-taking will save us late diagnosis. It will not only save late diagnoses in tuberculosis, but careful history-taking will save us a good deal in all fields of internal medicine. If there is any one thing at fault, it is in bad history-taking. Let

us take better histories and the rest of it will solve itself.

With reference to rest and exercise spoken of by Dr. Frazer, do not be afraid of rest. Rest is safe. The rest cure not followed by work cure is worse than nothing. Every patient should be kept under the care of a physician until the sum total of his exercise will exceed the sum total of his exertion afterward. This is one of the most important points among the ordinary regime. Part rest cure without subsequent work cure in a patient reaching a satisfactory result is worse than no rest cure at all. Let us be sure to work them back until the sum total of exercise exceeds the sum total of the exercise they expect to undergo in their return to their home or activities.

Do not be afraid to treat these patients too long. I treat all of my patients, when I can, longer than I think it is necessary.

With reference to the selection of cases, do not let us be too quick to give artificial pneumothorax when we do not have a lesion in the other lung. Much can be done in quieting down the better lung, and patients with artificial pneumothorax will become safe.

Let us be careful of the so-called "good" lung. Here is where the X-ray comes in. It is one of the places where the X-ray is of great use. I do not care how long we have been doing this work, there is a limitation. The X-ray has convinced me that there are great limitations. I have done enough work to know that I would be stupid if I did not learn all the physical methods. Let us X-ray our cases in which we expect to compress.

Dr. Stewart R. Roberts, Atlanta, Ga.—I should like to say a word, in the first place, on behalf of the masters to whom Dr. Thompson particularly referred, and secondly a word or two about tuberculosis in general.

Those of us who are tuberculosis specialists, or who have sanatoria, deal practically with only one disease, and this disease is tuberculosis. We do expect you to be masters of that disease. We expect you to be greater masters than any of the rest of us. The general practitioner ought to be able confidently to diagnose early tuberculosis. That is the one supreme proposition that the general practitioner ought to be capable of doing in reference to the tuberculosis problem. The supreme question that a patient can ask of a physician in this world is this, "Doctor, have I tuberculosis?" The supreme question is this: "As a general practitioner, as a man in internal medicine, am I able confidently to make a diagnosis of early tuberculosis?"

Everything that Dr. Thompson said in his paper about the inability of the medical profession to make a diagnosis of early tuberculosis is correct. It is one of the great indictments against us today. I see cases every week that are further advanced. I saw one case, a Methodist preacher, who had been to three doctors. One said he had pellagra; another said he was run down; and a third one said he had pneumonia. He was suffering from advanced tuberculosis, and he had advanced cavitation. Not by might nor by power, but by early diagnosis are we able to solve the tuberculosis problem. Read Osler's book. It is the master work to us. Read Cabot's "Physical Diagnosis." If you haven't it, get it. Sleep with it. Think about it. Take it with you and read it over and over. If you do not like that, get "Early Tuberculosis," by John B. Hawes, 2d. They are all good.

To be an expert physical diagnostician is very difficult. It takes years and years of labor. If one wants to go into this subject more deeply, perhaps the best work in the world is the book on "Diseases of the Respiratory Organs" by the elder Austin Flint. It is the most brilliant work that has ever been written in American medicine. I believe you can get a copy of it at any of the second-hand book stores for 75 cents.

Dr. James J. Terrill, Temple, Tex.—We are all very fully agreed that tuberculosis is universal, but we are not working on that theory. We are want to make fun of some of our practitioner friends in certain parts of this State by stating that whenever they have a patient with a little fever they say he or she has malaria and they give quinine. We make fun of those practitioners, but, my friends, if we take that position with reference to tuberculosis in our patients, it is a serious proposition.

Every doctor who goes to see a sick man should be an apostle and evangelist of decent living and balanced rations. His patients should be taught what decent living means; he should instruct his patients how to live; and if that were done more frequently than it is, I am convinced that fewer of our patients would develop tuberculosis from a clinical standpoint.

Practically all have the infection. We all have it, so let us be teachers and examplars of proper living to our patients. Let us talk to them about it. If they are not living right they have a right to expect us to tell them about it—I mean from a physical standpoint.

The average practitioner makes a great many more diagnoses of tuberculosis than one would at first suppose, but he is too cowardly to tell his patient that he has made a diagnosis of tuberculosis for fear that he will be looked upon as a tuberculosis crank in the community and patients will not patronize him for that reason.

Dr. H. L. Wilder, Glen Rose, Texas.—We general practitioners are the men that these patients see first. The burden of diagnosis is upon us. We send them to sanatoria and they are sent back home for us to treat; and they die. They die simply because you men muddle us up on the essentials. I am almost ready to believe, after what I have heard today, that we do not know the first principles of treating tuberculosis. One man recommends rest and says put them in bed and keep them there until they have no fever. Another one says get them up and give them a little exercise. With such diversity of opinion and with such confusion of views, what are we poor general practitioners to do?

I practice in a town of about 800 inhabitants, and I am trying to do my duty. But we can not do it if the experts come here and talk this way. We can not go into the medical centers and get our expert testimony any better. We can not read every book that comes out. We have got to make a living, and if the men in organizations of this character do not give us principles upon which to base our treatment and advise us what

to do so that we can grasp it and put it into use for the benefit of our patients, we are in a bad shape.

Dr. R. S. Loving, Dallas, Tex.—If every civilized adult has had his tuberculous infection since childhood, it will require some years for us to realize fully that adults, being already infected, are in no danger whatever from contact with consumptives. When we have admitted this among ourselves, it is our duty to tell the public. Some years will have elapsed before the truth is generally known.

A great deal has been said in this meeting about early recognition of tuberculosis, and rest has been thoroughly well emphasized. If adults have their infection always with them, and this infection may and does at any and multiplied times become manifest disease, there are doubtless many thousand latent tuberculous foci which, during a period of lowered resistance, break out in a flurry of fever only to subside again to the apparently normal condition without any one ever having suspected the truth. If this is true there are more cases of incipient tuberculosis which recover without treatment than there are those which progress.

It is a very serious matter to tell a bread-winner that he must quit work and go to bed for two or more months. Of course we all recognize that this is the best advice if the patient will accept it, but often he will not; and it is my belief that as a valuable alternative, and rather than turn him loose for even worse, he may, with benefit, be instructed in the conservation of his strength by a carefully planned system of rest.

He should live near or ride to his work to reduce the amount of walking. He should sit or lie down as much in the day as his duties will permit. He should ask for his employer's co-operation, and if possible get off an hour or so earlier for a while and go home to bed at the earliest possible moment. He should eat the morning and evening meal in bed and spend every available minute in recumbent rest.

Under this regime I have known cases to improve from the start and become arrested again in six weeks' time, after which the regular working routine was gradually resumed.

Dr. T. C. Gilbert, Dallas, Tex.—I think it would be impossible to lay too much stress upon the subject of tuberculosis, and I wish to emphasize some of the points brought out this morning. There is one idea that seems to have been prevalent which should be dispelled, and that is that a large percentage of general practitioners can not diagnose early tuberculosis. I believe that is a mistake. As the great Jenner has said, we make our mistakes not by not knowing, but by not looking. I believe if you only look for tuberculosis that you will certainly find it. There is scarcely a man in this hall who will not find cases of early tuberculosis if he will only take the time to work out his cases. If we keep in mind and remember the important points brought out by Dr. Thompson, we will find more tuberculosis cases early than we have done formerly.

Let us take the four symptoms—acceleration of the pulse, elevation of temperature, slight loss of weight, and a little cough, and I would add acceleration of the respiration. It is an interesting fact to me that lesions of the pleura and of the pulmonary tissue very early show an acceleration of the respiration. I think it would be well enough to remember that point in connection with the four symptoms mentioned by Dr. Thompson.

The prevalence of tuberculosis at present is appalling in the State of Texas, and particularly in this locality. Every three days in Dallas somebody pays the penalty of life on account of the prevalence of tuberculosis. In the last fiscal year in the city of Dallas there were 127 deaths from tuberculosis out of a total number of 1,637 from all causes combined. I think this one point certainly ought to be borne in mind, and that at every opportunity a physician has to study this disease he should do so.

Dr. Durel brought out the point this morning that physicians do not want to find tuberculosis. A great many of them who have found it do not tell their patients about it. I think that is a grievous error and one most costly to the patient.

Dr. L. J. Moorman, Oklahoma City, Okla.—I think what the doctor has just said is true. We do not find tuberculosis because we do not look for it. I recently had a talk with Dr. J. B. Murphy, of Chicago, whom you all know of course, and he said to me: "If I had my life to live over again I would study internal medicine and specialize in tuberculosis, the most prevalent disease known to humanity."

I would like to say this in behalf of the general practitioner: we must bear in mind the fact that incipient tuberculosis, as we understand it at present, is a clinical entity of comparatively recent origin. There are many men in the practice of medicine who have not had the opportunity to be well acquainted with the diagnosis of incipient tuberculosis. Up to the present time it has been impossible to become expert in the diagnosis of incipient tuberculosis in the course of the regular medical education.

Another thing I want to emphasize is the fact that even though we are trained in school, we become negligent when we get out and we fail constantly to practice what we know. We learn certainly by practice and by repetition, and often fail because we do not practice routine history-taking and physical examination.

Dr. S. E. Thompson, Carlsbad, Tex. (closing).—I am most grateful for the generous discussion accorded my paper. I am very sorry, however, that this discussion closed just when it did at the noon hour. I wanted to reply at that time to the doctor who said he was looking for help and ungenerously referred to himself as being "from the sticks." He is the type of man to whom I wish to bring aid. Having been a general practitioner, I know something of his burden. There is no branch of medicine whose devotees are more sincere in purpose and honest in effort. But no man can treat a case of pneumonia today, set a fracture tomorrow, deliver a woman and treat a case of typhoid the next and probably treat syphilis or malaria the following day and still find time to work out the problems of tuberculosis. I know this both by observation and experience, and this is my reason for endeavoring to simplify tuberculosis for the general practitioner.

This same doctor, pointing to me, said: "Doc-

tor, what are we going to do? We are honest; we are trying to do good work. We find our cases, send them out West to you; you keep them several months; send them back home to us and they die; every one of them dies." And he might have added the slang expression, "And that's no lie, Bill!"

Just four words answer his questions: Find your incipient cases. That is the contention in my paper. The patient is doomed before the diagnosis is made. We can no more grow a new lung in west Texas than we can grow a new foot or a new kidney. Find these cases when the disease first begins to express itself and they will get well at home under proper treatment. Do not expect us to perform miracles in west Texas. That day is passed if it ever existed.

Dr. Durel has been quoted as having said we can not make a diagnosis without the microscope. Dr. Durel did not say this. He said the microscope is our only means of diagnosing open tuberculosis, and this is true; but he will also tell you that every case should be discovered before reaching this stage. In other words, the microscope is the only means of determining whether or not a patient has bacilli in his sputum, but not whether he has tuberculosis. Dr. Durel was the first man to set me right on tuberculosis and I know he would not give the snap of his fingers for the microscope in the diagnosis of incipient phthisis. Any man who can not make a diagnosis without the microscope is a failure so far as tuberculosis is concerned.

Now, as a serious matter of fact, we are not finding these cases when we can and should find them. I do not believe in attempting to deny or palliate a fact, however embarrassing it may be

When I first took up the study of tuberculosis, my instructor would take an incipient case, locate the infected spot and have me apply my ear to that area, describing what I should hear, and to me it would sound perfectly normal. To my embarrassment, I was made to realize that I did not know a normal lung; and I graduated from a first-class college.

The doctor who just closed said we ought to teach medical students incipient tuberculosis. True; but I doubt that it can be done. You can take a patient with a heart lesion, let him lie down, and have fifty medical students listen to his heart without injury to the patient. Suppose we taken an incipient tuberculous patient, let fifty medical students go over his chest, one at a time; let each student require the patient to take a deep breath and cough and have him say over and over again: "A ragged ruffian ran round the rock." How long do you suppose your patient would be an incipient one?

One gentleman said that some of our specialists on tuberculosis recommended rest and some recommended exercise. In the treatment we recommend both. Rest, absolute rest in bed during the active, symptom-producing period. Graduated exercise after activity and symptoms have ceased.

Dr. Thompson Frazer, Asheville, N. C. (closing).—I shall not refer to the treatment of tuberculosis by rest and exercise, but I shall take exception to what Dr. Loving said, as I do not think we have a right, when we know a patient is tuberculous, to adopt half-way measures. When a person has tuberculosis we should treat him as such. Put him on absolute rest at the start. I do not think we are doing a patient an injustice when we discover tuberculosis or even suspect it by telling him at once of the condition, because while the immediate consequences may not be severe, as in a case of appendicitis or in some other acute disease, the ultimate results are just as serious. We work a great injury to patients unless we tell them as soon as we suspect tuberculosis and take all measures possible toward the recovery of their health, which is done by the institution of rest in the first place.

As to the diagnosis of tuberculosis, I think one of the most important means of arriving at a diagnosis is from the history, and that is a part which we too often neglect. I am surprised sometimes in looking over my case records to see the amount of information I have obtained after the patient has been under my charge for some time when I thought that I had taken an exhaustive history at the start.

As to the symptoms: the presence of continuous cough for several weeks is to be regarded with suspicion. In addition to that, and commonly before cough makes its appearance, we have so-called toxemic symptoms that may not be very definite individually, but that are in the aggregate very suggestive. There is a slight loss of weight; the fatigue is extreme; there is mental lassitude; there may be slight digestive disturbances, elevation of temperature, and the acceleration of pulse to which reference has been made. These, I think, are the main things upon which we may safely make a diagnosis of incipient tuberculosis.

DISTRICT TUBERCULOSIS NURSING PLAN IN FLORIDA.*

By Joseph Y. Porter, M.D.,
State Health Officer,
Jacksonville, Fla.

Florida has recently put into operation a plan which it is believed will secure a careful survey of the entire State to enumerate and locate the consumptives, and spread a knowledge of the disease that is within the reach of those of most limited means.

Florida's Board of Health does not oppose or depreciate the sanitorium treatment of the disease. It advocates it for those whose financial circumstances permit them to take advantage of the splendid discipline and attention it insures. But public sanitoria are quite another matter, involving great cost to the state

*Read by title, Section on Medicine, Southern Medical Association, Ninth Annual Meeting, Dallas, Tex., Nov. 8-11, 1915.

with very little practical return for the investment. I do not think that the efforts of older states in this direction have succeeded as expected. Dr. Campbell, of Ohio, and other authorities also hold this view.

The Board has realized that the erection of such sanitoria in Florida, for both races and both sexes, is beyond the practical financial reach of the State, when it is remembered that Ohio has expended nearly three-quarters of a million dollars for such an institution which has a capacity of only 142, while the canvass of the State shows more than sixty thousand patients entitled to its benefits.

But the Board appreciates the practical value of the open air treatment, which is within the reach of even the poorest. Consequently the State was divided into six districts, nearly equal in population, excluding the three largest centers of population—Jacksonville, Tampa and Pensacola—which have already taken the matter in hand more or less efficiently. Excluding these cities, the population of each of these six districts is somewhere in the neighborhood of 100,000. By competitive examination one nurse (though "instructor" would be a preferable term) was selected for each of these districts.

To each of these nurses is assigned the work of ascertaining as far as possible the location and circumstances of every tuberculous sufferer in her district. They are expected to offer assistance where it is acceptable, to advise not only as to the treatment in each particular case, but also to prevent the spread of the infection. The work of these nurses by force of circumstances must extend far beyond advice regarding the treatment of tuberculosis. It must include, if it is to be fully efficient, the wisdom to correct unsanitary conditions, to advise intelligently as to children's diseases and the many ills that commonly occur in rural communities more or less remote from the direct activities of local or city health boards, and where the services of the physician are not readily and quickly available.

This is of course a vastly different problem from that of municipal district nursing. With each district comprising a population of approximately 100,000, it is manifestly impossible for the nurse to make frequent visits to each patient. Consequently much of the follow-up work must devolve upon local officials, women's clubs, boards of trade, or other similar organizations. In view of these problems and the difficulties arising from the large population under the supervision of a single nurse, the following general outline was adopted for the work:

I. PRELIMINARY SURVEY.

A hurried general survey tour of entire district, determining most heavily infected localities, interviewing all physicians, endeavoring to enlist their co-operation, and getting as complete reports as possible of all existing cases. Interviewing local authorities and influential citizens in effort to arouse local interest. This survey of the districts (occupying from six to ten weeks) should give some information of value as to the distribution of disease, thus pointing to those sections in which the intensive work should first be attempted.

II. INTENSIVE WORK.

A. General (very important).

1. Further interviews with officials, women's clubs, boards of trade, etc., and meetings with women's clubs and other organizations for the purpose of establishing local anti-tuberculosis organizations, which will attempt to keep interest fully aroused during the nurse's absence, to locate cases of the disease and to render financial assistance to indigent cases and their families.

2. Work through the schools' "mothers' meetings," etc.

3. Distribution of posters, etc., and other general educational work.

B. Individual.

1. Visit as nearly as possible all known and suspected cases of tuberculosis (with the attending physician whenever possible, though I am inclined to believe that very little *active* co-operation may be expected from the physicians as a whole). Make report as to patient's condition, financial condition of family, sanitary conditions of the home.

2. Advise patient as to best measures to be adopted for his own physical improvement. If the patient seems intelli-

gent enough to profit thereby, supply literature.

3. Advise patient and family as to best measures for prevention of spread of the disease to other members of family and outsiders. Give patient all necessary information as to where supplies (sputum cups, etc.) may be purchased. Try to make this advice *practical* and easy of application. Preventive theories are worthless unless they can be readily understood and employed by persons of limited means and of comparatively limited intelligence.

This work along the above lines has been in operation only three months, and, while our experience is, of course, very limited, still it seems to promise very favorable results, and that, too, under what may be considered rather unfavorable circumstances. Owing to the fact that much of our State is very sparsely settled, work of this nature is rendered even more difficult than in some of the more thickly settled states, especially those with small Negro populations.

One of the chief difficulties to be overcome it seems is the hesitancy on the part of the physicians to insist upon thorough examination of their patients, both clinical and microscopical, and a tendency to conceal the true condition from them for fear of offending them and thus losing their practice. This fact has been mentioned on several occasions by each of the nurses. On the whole, however, a fair degree of co-operation has been secured both from physicians and local authorities, notably the women's clubs; and as the work progresses and becomes more familiar to the people of the State we may expect, I think, much more help from these sources.

A brief summary of the work of the past three months follows, though its scope is so broad and its nature is so diversified that we may not hope by a mere tabulation of figures to show even a small part of the actual results which have been accomplished.

This is the beginning of a work of possibly immense benefits to the people of the State in an educational direction as well as in practical advice regarding the home, open air treatment of tuberculosis. It is confidently believed that its successful issue will warrant its speedy and wide extension by the employment of a larger force of capable, self-sacrificing women.

	No. patients under instruction on previous visits.	New cases located in Sept.	Cases found to have died.	Cases removed.	Apparently cured.	Total now under instruction.	No. following instructions.
Western District	84	21	8	3	0	94	90
W. Central Dist.....	71	13	6	1	4	75	40
Central Dist.	64	12	8	6	2	60	60
N. Central Dist.	73	46	2	3	0	114	33
S. Western Dist. (*)..	146	33	13	17	2	117	48
East Coast Dist. (**)..	...	91	4	2	0	91	...
Total	438	216	41	32	8	551	271

(*)Covers more than period of three months.

(**)Covers period of one month only. No second visits as yet, hence impossible to fill in last column.

STATE BOARD OF HEALTH OF FLORIDA.

Use of Blanks, Supplies, Etc., by District Tuberculosis Nurses.

Form 339 (Post Card Notification) should be used and sent to this office for notification of cases of tuberculosis seen or heard of by nurses. Can also be used for other diseases.

Form 340 (White Card Record) should be used for reporting to this office each separate visit to each patient or any change of condition. In addition, a copy of the notification (on Form 339) of each case reported to this office should be kept by the nurses on this form 340 for continuous personal record, and notes of each visit, change of condition, etc., made thereon; and this card should be retained by nurse until such time as the case is closed (by recovery, death, removal, etc.), when the card should be sent to this office.

Form 331 (Monthly Report) should be filled out from data on nurse's case records (on Form 340), and from her daily notes of societies organized, meetings attended, etc. This should be sent in at the end of each month and should be accompanied by a letter of transmittal with any special comment, recommendation, etc.

Form 206 (Expense Account) should be filled out and sent in as thereon directed and in accordance with previous personal instructions.

Form 333 (Itinerary Cards) should be sent in for each change of location or address.

Form 309 (Post Card) should be used to notify physicians of nurse's intention to call. Mimeograph directory of physicians should be filled out and sent in for each locality visited as thereon indicated.

Form 185 (Container Request) should be sent in for each case where laboratory diagnosis is to be made.

Form 327 (Literature Request) is to be filled out and sent in for literature to be sent patients or others, and also for supplies, literature, etc., for nurses. Manilla envelopes are sent for its mailing.

Form 336 (Pellagra Cards) should be given any

physician who has not received it direct from this office.

Form 341 (Individual Case Record). This is sent as specimen that nurses may see tentative form of data and method of keeping record.

Publication 92 (Rules and Regulations) is sent for reference.

Map of each nursing district with postoffices in each is sent to facilitate the work.

A supply of available literature is sent, and as more is printed, further supplies are sent. "HEALTH NOTES" each month give literature available for distribution.

Stationery, carbon paper, envelopes, etc., are also sent.

AUTHORS' ABSTRACTS

Medicine

Clinical Notes on the Use of Alcresta Ipecac in Amebic Dysentery. By William Allan, Charlotte, N. C., American Journal of Tropical Diseases and Preventive Medicine, May, 1916, p. 603.

Ten cases of amebic dysentery were treated with alcresta ipecac, giving 200-grain doses to adults and 100-grain doses to a 35-pound boy, without toxic symptoms. Favorable clinical results were obtained in four instances, emetin by mouth proving in these cases to be just half as effective as when given hypodermatically. The narrow margin of safety between the therapeutic and the toxic dose of emetin makes it impossible to give enough of the drug by mouth to overcome the variation in absorption from the intestinal tract. As the author thinks maximum therapeutic doses are necessary when emetin is given by hypodermic with prompt and complete absorption, he thinks maximum doses all the more necessary when emetin is given by mouth with consequent slower and less certain absorption. A less toxic alkaloid that could be given by mouth is very desirable.

Transient Auricular Fibrillation in a Healthy Man Following Hydrogen Sulphid Poisoning. By G. Canby Robinson, St. Louis, Mo., Journal of American Medical Association, May 20, 1916, p. 1611.

A case of an apparently healthy man of 44 who was overcome by hydrogen sulphid in a chemical works is reported. He had a short period of unconsciousness, but soon regained consciousness and was only dazed when admitted to the hospital. The pharynx was injected, and subcrepitant rales were heard generally throughout both lungs. The heart was beating irregularly — 66 per minute — and electrocardiograms showed the presence of auricular fibrillation. A few hours later the heart became regular — rate 60 — and electrocardiograms showed a normal cardiac mechanism except for a slight delay in conduction. The outline of cardiac dullness was a little larger after the normal rhythm set in and the heart sounds were better heard. Systolic blood pressure 120 mm. Hg., diastolic 75. The man was apparently healthy and went back to work in three days.

It is the occurrence of auricular fibillation in an apparently healthy man that makes this case worthy of record. Whether the hydrogen sulphid or some unknown factor was the cause of the fibrillation can not be determined. The case is reported on account of its bearing on the important question, what is the determining cause of auricular fibrillation in man? It is a very common condition in patients with heart disease. Electrocardiographic records have been obtained from over thirty cases in the past ten months. This case seems to rule out the necessity for heart disease as a basis for fibrillation, and shows that the heart of an apparently healthy man may go into a state of auricular fibrillation and return to the normal mechanism within a few hours. The case is reported because of a belief that such cases have a definite bearing upon the very important problem, which is far from being solved, namely, the cause of auricular fibrillation.

The Treatment of Cardiac Syphilis. By James M. Anders, Philadelphia, Pa., New York Medical Journal, May 6, 1916, p. 865.

After insisting with Longcope, Grassman, Brooks and others that lesions of a serious character may appear as early as the forepart of the second stage, he briefly describes their pathologic nature. The presence of spirochetes leaves no room for doubt that these arterial and myocardial changes are dependent upon syphilitic infection.

Perhaps one of the principal reasons why treatment should be carried out at the earliest possible period after infection lies in the hazard and danger from the administration of salvarsan in cases in which severe forms of cardiovascular syphilis subsequently develop. An investigation into this question has revealed the fact that deaths, occurring either suddenly or after several days, from the use of salvarsan or neosalvarsan, are due, in the immense majority of cases, to myocardial degeneration secondary to coronary lesions.

The most successful method of treating the cardiac lesions in the acute and secondary stages is as follows: Vigorous administration intramuscularly of mercuric salicylate (pushed to the limit of tolerance), followed by salvarsan, which is also to be given intra-muscularly. After the lapse of a few days the mercury must be resumed. The criterion of sufficiency of specific treatment is a negative Wassermann reaction.

In the management of the tertiary stage in which dropsy may be associated, the usual circulatory indications are to be met as under other circumstances. In well marked cases of syphilitic myocarditis and in aortic incompetence, mercury should be given a prolonged trial by inunction, and this failing, by the hypodermic method. If this does not yield a favorable result (e. g., a negative Wassermann reaction), then salvarsan should be administered intra-muscularly,—at first, however, in small doses. The injections must be followed by a period of absolute physical rest for from 24 to 36 hours, preferably in a hospital.

Held recommends in instances of myocardial degeneration that the patient be kept at rest for two weeks. The iodids are indicated in the treatment of cardiac syphilis after the active process has been checked.

TROPICAL DISEASES AND PUBLIC HEALTH

THE REAL VALUE OF CLIMATE.

By C. M. Hendricks, M.D.,
Medical Director, Hendricks Sanitorium,
El Paso, Tex.

The word climate comes from a Greek word meaning an inclination or slope. It was applied anciently to signify the supposed horizontal obliquity of the surface of the earth from the equator to the pole. Climate, as we understand it at the present day, is usually stated in terms with reference or regard to the temperature of the air, its humidity, motion, density, transparency and electrification; also to the amount of precipitation. The conditions that cause variations in the intensity of climatic elements constitute climatic factors; the principal ones of which are latitude, altitude, distribution of land and water, mountain ranges, ocean currents, prevailing winds, the nature of the soil, and its drainage and vegetation. These factors may be classified as fixed or natural factors and the dependent and resultant factors. The fixed factors are altitude, latitude, distribution of land and water. The dependent or resultant factors are the prevailing winds, precipitation, drainage and vegetation. As different regions and places on the earth's surface differ with respect to one or more of these factors, the climate of such regions necessarily differs. To describe exactly the climates of the different regions of the earth would be a task too great to be undertaken, but fortunately such exactness is not necessary to a practical comprehension of the climatic possibilities of any given spot on the globe.

The relation of climate to the organic world is one of the most interesting, and at the same time intricate, of the problems that present themselves for scientific investigation. These relations of climate have been discussed from time out of mind, but beyond a few generalizations, little as yet has been found out. That climate does control, absolutely in some way the forms of life scattered over the earth, is generally admitted. It is, indeed, the foundation stone of the modern theory of evolution. Whether it will ever be possible to demonstrate with any sort of precision the peculiarities of form, habits and health that are necessarily the outcome of a given climate, can not be asserted at present.

If the presence of man only be considered we would find that he exists in all known climates. So far as ability to live is concerned, man appears, at first sight, to be independent of his climatic environments. Yet such is actually not the case. By intelligent foresight man is enabled to combat more or less successfully effects that would otherwise overcome him. Virtually he makes for himself an artificial climate. Deprived of the means of surrounding his person with this artificial climate, he would be restricted to very narrow geographic ranges. By the addition of clothing, he conserves his body temperature; he re-enforces when necessary his protection by refuge in dwellings, and by the aid of artificial heat. On the other hand, when his climatic surroundings go to the opposite extreme, he constructs fans to create artificial breezes, and he produces ice to cool himself. If the region does not produce the food that he requires, he transports it from where it can be obtained. Should the resources at his command prove insufficient for health and happiness, he migrates to a climate more to his liking.

Different races are endowed with different degrees of climatic resistance. The Eskimos, living in the cold and cheerless North, wrapped in skins and huddled in ice dens as houses, find life outside the artic circle almost unendurable. The Latin races of Europe live readily in the tropics where the Teutonic stock must struggle incessantly for existence. The Chinese may be found living from Manchuria to Australia, while the Jew lives everywhere. He is as much at home in the climates of Siberia as in his native

Palestine, and he is found from Cairo to the Cape. All this shows that it is not so much the climate as it is the man and the race. It is the personal equation of living after all, the habits and modes of life, that account for this varied tolerance.

Climate places its imprint upon social life and customs. In the deserts and on the great treeless plains where water and grass often fail, man becomes a nomad. In the forest regions he fells trees and builds a cabin. The character of the climate effects the habitation he erects for his use. Under the hot sun of the tropics his house is open and low, the shade is sought and every breeze courted. Farther northward the house grows higher, and the openings are fewer and fewer. From an open construction it passes to brick and stone and compact structure; every device that promises to keep the outside climate out and the inside climate in is sought.

Climate leaves its imprint upon fiction and history, upon poetry and prose, religion and superstition. To the wandering Bedouin, he who dug a well was a benefactor. To die of thirst is an Arab's direst curse. Green trees and running waters are his ideals of Paradise. In the colder North, where the sufferings from cold and want of heat are felt, demons in red, with heated forks and fiery furnaces, terrorized the wicked and restrained the good, and the halls of Valhalla were the hope of a hereafter.

Upon the features climate apparently has had little influence; if it does have an influence, the periods of time required are relatively so great that we can not measure them. Within historic times there is no evidence of change, for the Ethiopian of today, no matter in what climate, is the Ethiopian upon the bas reliefs of Nineveh and Babylon, and the modern Egyptian fellah wandering about the streets of Cairo was depicted in the reign of the Pharaohs. From the influence of climate on man's modes of life, it follows that directly or indirectly climate must exert a profound influence upon his physical well-being. Abundant evidence of this influence is seen in the geographical distribution of certain diseases and their behavior when transported by commerce and migrations to other regions.

For instance, cholera and yellow fever are endemic within the sea level altitudes of the tropics. Both occasionally are carried by agencies beyond their indigenous climates, and both after a greater or less time disappear completely from their new homes. Malaria is a widespread disease extending geographically on each side of the equator to the limits of the isotherm 60 degrees; beyond this it is not known to originate. Climate also has its effect upon the symptoms and course in typhoid fever. The most important influence of climate is that which it sustains as a predisposing agent. The manner in which this influence may be exerted will depend upon the nature of the disease. The virulence of such germs as tubercle bacilli, anthrax, typhoid, cholera, and the various pyogenic bacteria are almost wholly dependent upon meteorological agencies. The corroboration of such a proposition is furnished in the experiments that have been made by different observers on the attenuation of microbic virulence when the micro-organisms were grown under certain physical conditions of temperature, humidity and illumination. The effect upon different pathogenic micro-organisms is particularly noticeable in respect to sunlight. Moist bacilli and spores of anthrax are killed by two hours of direct exposure to the sunlight. It has been many times demonstrated that a few minutes in the sunlight will kill tubercle bacilli, and that diffuse sunlight will kill them in a few hours. Experiments have shown that physical environment can profoundly alter the resistance of the host to infection. Hens will not contract anthrax unless they first be chilled by exposure to cold. Frogs, on the other hand, are only infected in an atmosphere of 80 or more. Bowditch, of this country, and Buchanan, independently in England, showed that soil dampness favored the development of tuberculosis.

The treatment of disease by climate forms an interesting and important chapter in medical literature. The particular manner and the properties of climate that effect the cures are still subjects of medical polemics. Up until the present time climato-therapy has been considered nothing other than empiricism. Many years

ago, when tuberculosis was considered a hopeless disease as to cure, now and then a determined victim would seek another climate. They went North, South, East, and West in the hope that the change might have a favorable influence. Apparently more of those who went West were materially benefited, because little colonies sprang up in the arid wastes of the Rocky Mountain region. The stories of their experiences were told to their friends and their former physicians who had despaired of their lives, the result of which was that the physicians of the East began advising their tuberculous patients to go West and seek altitude, moderate temperatures and clear skies. This has gone on steadily during the past forty years until now, where the little colonies once stood, are prosperous and growing cities which are glorious monuments to the thousands of cured cases of tuberculosis.

Unfortunately, great numbers of the cases who were sent West did not recover. The two principal reasons for this were, first, the far advanced cases were sent away indiscriminately, and secondly, a great many cases had only climate to depend upon. The physicians then of the Rocky Mountain region began to build sanitoria and to institute campaigns against sending the far advanced cases, and at the same time making a plea for the early diagnosis of the disease in each instance. After it had been successfully demonstrated to the medical profession of the United States that the hygienic and dietetic treatment for tuberculosis actually produced results, the profession in all parts of the country instituted the *home treatment* and, obtaining fairly good results, began a campaign against climatic influence. So rabid are the views of some of these men that it is interesting here to quote from Horace Greeley:[1] "There are many and eminent authorities who recognize that the best results do not come from seeking an El Dorado in climate. That certain extremes of heat, cold, dryness, excessive air currents, etc., are objectionable is well known to every practicing physician. The usefulness of sunshine needs no emphasis, but neither sunshine nor dryness nor altitude is invariably favorable nor essential. The best climatic results are largely due to good hygiene and care and not to any especial virtue of climate. This fact is leading to a most desirable result, namely, sending fewer patients to a distant and unknown region purely for climate."

We men of the Rocky Mountain region who have been devoting our lives to the study and treatment of tuberculosis have experienced and observed that patients in sanitoria do arrest their disease, and often effect permanent cures in a few months after having been treated in equally as good sanitoria in the East for even a greater period of time with no apparent beneficial result. The fact is we are thoroughly convinced that the climatic factor is of paramount value, and this conviction is due solely to our experience. Until recently, we could offer little in the way of scientific explanation of why climate influences favorably the treatment of tuberculous conditions. Dr. E. S. Bullock[2] was one of the first, if not the first, to show that the results obtained in sanitoria of New Mexico as compared with the results obtained in Eastern sanitoria were greatly in favor of climatic influence. It was shown several years ago that the characteristic effects of favorable climate are: First, diminished barometric pressure and consequent rarefaction of the atmosphere; secondly, diathermancy of the air, or the increased facility by which the sun's rays are transmitted; thirdly, asepticity or freedom from pathogenic germs as proved by the researches of Pasteur and others. The effect of mountain air on the organs and functions of healthy or sick persons has been ascertained by repeated and careful observations to be as follows: The skin is tanned by the solar rays and, according to Dr. Bowles, principally by the ultra violet rays in the attenuated atmosphere. The circulation is at first quickened, the heart's impulse becomes more powerful, but the pulse rate at the end of six or eight weeks falls to normal, or even below. The breathing is slower and becomes deeper, the inspiration longer, and the expiration more complete. At first there is a reduction of the blood pressure, and an increase of carbonic acid gas and water are eliminated by the lungs. Accompanying and exactly coinciding with the reduction of the pulse and respiration, the thorax ex-

pands in several directions, causing an increase in circumference of the chest at all levels. More oxygen is consumed by the blood and more carbonic acid is given off. It must be admitted by every one that the ability to live out of doors without undue exposure in a favorable climate is a great aid in carrying out the hygienic treatment. It also must be admitted by all that the change from a dark, bleak, cold, damp and foggy climate to one of dryness, mildness and sunshine will exert a favorable influence upon the mentality of these patients.

In the study of these patients has it occurred to us what physiological and pathological, if you will, changes must take place that a patient will improve from infection due to tubercle bacilli. The infection itself is combatted by the lymphocyte which must be stimulated to action by a specific opsonin or antibody. The waste produced by the constitutional effects must be replaced by food and certain hematological changes, namely, increase in the red cell count, increase in hemoglobin, increase in blood platelets, and increase in blood pressure. Since it has been successfully demonstrated that the mononuclears are the ones principally concerned in combatting this infection, it would be our aim then to increase their number as well as to increase the amount of opsonin necessary to stimulate them. It has been recently conclusively shown that tuberculo-opsonin is contained in large quantities by the blood platelets. It has been shown by Webb[3] that there is a definite increase in the mononuclear count in patients going from sea level to an altitude of 6,000 feet. This has been later confirmed by Staines, James, and Rosenberg[4]. These observations as above stated were made both at sea level and at an altitude of 6,000 feet. We have found in our laboratory observations the same percentage of increase in mononuclears in patients going from sea level to an altitude of 4,000 feet. Webb and Gilbert[5] have also demonstrated that the blood platelets are increased in patients going from sea level to an altitude of 6,000 feet. It has been shown by many observers and absolutely confirmed that the red cell count is increased by altitude. Observations made by Staines, James, and Rosenberg[4] show that the reds are increased 22% at an altitude of 6,000 feet. These observations were made simultaneously in New York and Colorado Springs on normal healthy individuals, which makes their work all the more valuable. Our observations have been confined to counts made on tuberculous individuals the day of their arrival in an altitude of 4,000 feet and compared with a count made after one month's stay in this altitude. These observations cover a series of 210 cases with an increase of 28%. Bullock and Peters[6] made a study of blood pressure in 600 cases and their conclusion is that the blood pressure is absolutely increased at elevations of 6,000 feet. This has been corroborated by others. Our own observations show an increase in patients that are progressing favorably. From the above observations and conclusions, it has been absolutely established that altitude has a favorable influence upon the blood changes that are necessary in favorably influencing tuberculous infections. By comparing our own observations with those above mentioned, it will be seen that these blood changes take place at an altitude of from 4,000 to 6,000 feet. It is also well to note that the observations made upon healthy individuals would explain, or at least partially prove, that there is an increased resistance maintained in normal individuals in these altitudes.

Owing to the fact that the air is practically sterile in these altitudes, due partially to its rareness and mostly to the extreme dryness, it is easy to understand why we have so little trouble with mixed infections and their deleterious effects. It is a well-known fact observed by every man who has dealt with tuberculous cases in the Rocky Mountain region that night sweats disappear almost immediately upon their arrival.

In another paper in which I made a study of some two thousand deaths from tuberculosis in the city of El Paso during the past seven years, it was found that nine (white) indigenous cases succumbed to the disease; that the actual number of indigenous cases was on the decrease in the city of El Paso. This study was made from the records of the City Health Department. This is nothing short of a marvelous revelation when we take into consideration that on account of the fact that hundreds of cases each year migrate to that City, thereby producing more cases

of tuberculosis per one hundred population than in almost any community you might mention; especially when we consider that little is done by health regulation to prevent wholesale contagion and infection. The fact that there are no more indigenous cases would tend to show that there is either an increased resistance on the part of the healthy citizens of this district, or that the climatic conditions are decidedly detrimental to the growth, development and dissemination of the bacilli. Most probably it is due to both of these factors. It would be reasonable to conclude that in a climate in which there is a development of such few cases, regardless of the fact that the daily exposure of the healthy individual is increased tenfold or more over any Eastern or Southern city, such a climate would have a favorable influence upon an individual already infected.

In conclusion, then, it is safe to say that the climate is most favorable which presents the meteorological conditions which to a greater degree than before and more constantly permit him to lead the necessary outdoor life with ease, safety, and economy of vital expenditure. The accompanying change of scene and surroundings may be expected to act advantageously in an indirect way.

In making any proposed change of climate attention must be given to the facilities in the new region for obtaining suitable food, accommodation, care and medical supervision. If these conditions can be as well met in a better climate as at home the patient should be advised to make the change.

If the patient's financial, social or domestic circumstances are such that he can not in a new climate secure proper medical attention, or if his mental attitude is such as to make separation from home inadvisable, he should not be sent away.

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SOME OF THE PROBLEMS IN PUBLIC HEALTH EDUCATION.*

By J. D. Davis, M.D.,
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Since it is only through education that any lasting results can be accomplished toward increasing the public health, all public health workers may be justly called educators.

And when work of this kind is inaugurated one of the first problems met is a lack of interest on the part of the individual physician. Of course the medical profession in convention assembled, and in its official journals and other publications, is heartily in favor of any effort in the advancement of public health work and education. But when the doctor goes back to his daily work his enthusiasm is too often left behind.

People usually get their ideas and information or misinformation about things pertaining to their health from their physician; and he is certainly not very much interested if he lets his patients believe that malaria is caused by bad air, that tuberculosis is hereditary, and that typhoid fever and hookworm disease have no relation to the sanitation of the surroundings. It is remarkable how many people still believe these things.

No doubt it will be said that the doctor is not paid to be both physician and teacher, and this is all too true. And again it is contrary to human nature to show much enthusiasm in promoting a cause that is supposed indirectly to decrease one's income. But if the individual physician would teach his patients the importance of preventive medicine and demand pay for his advice as well as for his prescriptions, his income would probably not be curtailed, and the people in turn would no doubt have more respect for, and take more interest in, public health work.

Another problem workers in this field have to contend with is the fact that people of the so-called better class often think they know enough about sanitation and subjects of this nature, and that this work is for the benefit of the poor and illiterate

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classes. Consequently they are not willing to assist with their influence and finances. If we can get them to realize that unless all are educated along this line they are in danger themselves, and that it is only through their influence and example that the lower classes can be reached, they will more readily take an active part in the work. I want to say just here, however, that even among the so-called educated people the ignorance upon health subjects is simply appalling.

Still another hindrance to public health education is a fear upon the part of the physician in his home town that he will go contrary to some rule of medical ethics if he publicly promotes this cause by use of the press or by talks to schools or to local organizations such as parent-teacher associations, civic leagues, etc. And unquestionably there is room for much abuse in this respect.

This may seem to be putting the burden upon the physician, but who is better fitted to take the lead until the time shall come when we have whole-time county and city health officers and sanitoria?

Finally, the greatest problem is to reach the children in this educational work. We notice that too often the grown people, to use a homely expression, are "set in their ways," and many have already drawn their own conclusions about health matters; but the children are ready to learn, they are seeking education; and in reaching the school children we reach all classes. So it seems to me that public health education should be carried on in the public schools. No doubt this question will come up for settlement in the various Southern states in the near future.

NOTES FROM FIELD WORK—MALARIA SURVEY OF IMPOUNDED WATERS.

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SEASONAL BREEDING OF ANOPHELES QUADRIMACULATUS.

The writer noted (American Journal of Tropical Medicine, June, 1915), some observations on the differential seasonal breeding of A. quadrimaculatus and A. punctipennis. These were continued last season.

In the survey made (LePrince and Donley) of the pool of Lock 17, Coosa River, in October and November, 1914, out of 1,253 larvæ developed, 101 were A. quadrimaculatus and 1,152 A. punctipennis. Leaving out one place—a deep sheltered bight examined during the beginning of the work, the records show 36 quadrimaculatus and 1,136 punctipennis. In the survey of the same pool made by our party (LePrince, Griffitts and Carter), May 26 to June 26, 1915, the count showed A. quadrimaculatus 2; A. punctipennis 628. The greater part of these were found in streams and small marshes and not in the pond itself. Where found in the pond, it was in water backed up in the lower reaches of streams under conditions which led us to infer that these larvæ or the eggs which produced them were in many—possibly in all—cases washed down from the stream above pond water. This, however, scarcely concerns the question.

A survey made of the same region by the same party—August 16 to September 20—shows a very different distribution of species. Some 600 imagos were developed from larvæ caught from the pond. Some of the hatching notes are not on hand. Such as are, give

A. quadrimaculatus	359	78%
A. punctipennis	92	20%
A. crucians	9	2%

A. quadrimaculatus which was absent from the June catch and, from a sanitary standpoint, from that preceding Fall, was now abundant. There were absolutely more A. punctipennis in the pond than there were in June, but A. quadrimaculatus exceeded them. A further examination of the pond made October 26 to 30 by Griffitts showed

A. quadrimaculatus	19%
A. punctipennis	71%
A. crucians	10%

The relative abundance of the two particular species is reversed. Punctipennis larvæ were not more abundant than in September, judged to be less, so there must

have been a marked diminution of A. quadrimaculatus. Griffitts states that it was a late Fall and the weather warm during the time of the examination.

In this section, then, A. quadrimaculatus was not producing during 1915 so as to be of sanitary importance until after June 26, probably not until well into July. It was a late Spring. This form bred freely during Mid-Summer and early Autumn and the breeding decreased rapidly with the advent of cooler weather. It was practically not found after October 18, in 1914 — that Fall being an early one. The same seasonal variation of breeding of the two species was noted at the pool of Lock 17, Black Warrior River, but the examination was less extensive.

ANOPHELES IN HOUSES IN THE DAY TIME.

During all of our surveys in 1913 to 1915, A. punctpennis was found far more rarely in occupied residences than A. quadrimaculatus; and far more rarely than this species, A. punctipennis was found in stables, chicken houses, etc., or in hollow trees, culverts and similar hiding places. This was true even when A. punctipennis was being produced freely close to the residences examined. During the Summer (June 15 to September 20) A. punctipennis was noted in only one occupied residence, out of over 200 examined. In outbuildings it was common and even under residences not rare. It is to be noted that all our examinations were made in the day time. To give the proportionate number of the two species found in and about residences would mean nothing unless the distances from the sources of production of each species and proportionate production of such sources were known. We were fortunate, however, to find one place, — the village of Talladega Springs, Ala., — where such data could be approximately secured and the numerical data presented will, we believe, be interesting.

In a section of this village, ten houses apparently received their mosquitoes from (1) a small branch producing punctipennis profusely and this form only, and (2) a concrete tank yielding about 5% quadrimaculatus to 95% punctipennis, — also breeding profusely. There were other sources of punctipennis within a reasonable distance, but none of quadrimaculatus for about a mile or over. Counting the production of the stream as equal to that of the tank,—it was this at least,—the production of the two species close by these houses should be 2½% and 97½%, respectively.

The ten premises gave:

ANOPHELES PUNCTIPENNIS.

In Residences	Under Residences	Outbuildings
0	3	30

ANOPHELES QUADRIMACULATUS.

In Residences	Under Residences	Outbuildings
24	21	24

The residences then give, inside and under, a ratio of 1 to 15 (3 to 45). That of the production is 40 to 1. In other words, we found about residences 600 times as many quadrimaculatus as A. punctipennis, *in proportion to production* at *about* the same distance from the source of production. If we considered only the insects *in* the residences, the proportion above becomes infinite.

The examination of 41 premises, including the above ten, having an occupied residence on each, in the village gives:

ANOPHELES PUNCTIPENNIS.

In Residences	On Porches	Under Residences	Outbuildings
1	1	19	61

17 in walled spring.

ANOPHELES QUADRIMACULATUS.

In Residences	On Porches	Under Residences	Outbuildings
43	4	31	91

1 in walled spring.

Numerical comparison is not possible here, as the houses undoubtedly received mosquitoes from a number of breeding places, some producing one species and some the other. They were, however, on the average decidedly closer to places producing punctipennis than to those producing quadrimaculatus, and the production of the first was many times greater

than of that of the second. Note, too, the reversed proportion in the walled spring.

The general fact that, having regard to production and proximity of source of production, A. quadrimaculatus is much more often found in residences than A. punctipennis had been noted by our party for the first three years, and I presume has been noted by others, but this is the first opportunity for comparison of the habits of the two species with even approximately definite numerical data that we have had. It is less extensive in number of houses (10) and less close to the approximation of the production than one could wish. A few (very few) observations made early last Spring and in October may tend to show that A. punctipennis is more often found in residences in cold weather than in Summer, but are not enough to quote. Note how much oftener they were found in outhouses than in the ten residences. Whether she does not enter residences at night, or enters at night and leaves, may be a question and we plan to answer it next Summer. The work of King, confirmed and extended by Mitzmain, has proved that A. punctipennis is readily infectible with malaria and can convey it. To what extent she *does* convey it depends on the answer to this question.

LePrince suggests that possibly this species prefers to feed on animals rather than man. It is to be noted that dogs and frequently chickens and pigs are found under the houses we examined. However this may be, that species bites men quite readily outdoors and in our experience is more apt to do so in the day than A. quadrimaculatus.

ANOPHELES QUADRIMACULATUS — PREFERENTIAL BREEDING PLACES.

It is well known that the breeding habits of the different species of Anopheles in the United States differ and that this difference may be of much sanitary importance. A striking example is given by Howard, Dyar and Knab ("Mosquitoes of North America," p. 221).

We found what may be a distinct preference of A. quadrimaculatus for pond water as a breeding place as compared with small marshes and running streams. In certain parts of the ponds and under certain conditions both A. quadrimaculatus and punctipennis breed freely. In the small running streams and marshy places in the neighborhood of the pond, from one-third to one-half mile distant, A. punctipennis was practically the only form found. This was breeding freely and profusely.

Some field notes of the August and September survey, 1915, of the pool of Lock 12 on the Coosa River, give of imagos developed from larvæ taken from pond water:

A. punctipennis	92
A. quadrimaculatus	359

From marshes, rivulets, etc., in the neighborhood of the pond:

A. punctipennis	684
A. quadrimaculatus	2

The small stream running through the village of Talladega Springs gave a pure culture of A. punctipennis, while the bight of the pond in which these streams emptied,—say a half mile to a mile distant,—was breeding A. quadrimaculatus freely with A. punctipennis as well. The marshes in this neighborhood were also breeding A. punctipennis only and freely.

The same was true of the Parr Shoals pond on the Broad River, South Carolina. Our first collection there July and August gave in the pond:

A. quadrimaculatus	249
A. punctipennis	42

From running water and marshes of the pond:

A. quadrimaculatus	2
A. punctipennis	280

It is probably enough that these two A. quadrimaculatus are accidental contaminations, as we were then picking up larvæ from the running water with medicine droppers which had just been used to pick up larvæ from the pond, and some of the first may have been left in the rubber bulbs. No more were found when separate droppers were used for the two classes of places.

A thing that impressed us here was that A. quadrimaculatus not only was

found in the pond, but was not found in the neighborhood of the pond in breeding places where one would naturally expect to find them. It was a fairly flat country and showed a number of small marshes, of little pools of clear water in grass, ditches, pot holes, etc., in which one expects to find this species and in which we did find them at Eau Clair, about twenty miles distant from Parr's Shoals. The same thing occurred at the examination of the Coosa pond. Although there were no check examinations there in which we found quadrimaculatus as at Eau Clair, yet finding the imagos of this species in considerable number in houses at Shelby—five or six miles from the pond—and in other houses in the country one and three-quarters to two and one-half miles distant shows, I think, that they do breed in this section.

As far as it went, it was not extensive, the examination of Pool 17 on the Black Warrior evidences the same thing. It looks as if the pond were a *preferential breeding place* for A. quadrimaculatus, so that *when a pond is available this form will breed nowhere else; and that places which produced this form before the pond was made may do so no longer.* If this be true, to determine the influence of the pond on the production in any district of A. quadrimaculatus we must deduct from the production of the pond the number formerly produced by former breeding places *outside* of the newly made pond and now no longer producing, as well as those covered by the pond.

The writer is aware that while this hypothesis will explain the facts observed, and hence is an *allowable* deduction from them, it is not a *necessary* one. To determine this question, it is proposed that the sites to be occupied by a large pond and its environment be surveyed *before* the pond is made as well as afterward. If the site selected be in a district in which A. quadrimaculatus is breeding pretty generally this question can be determined. If after the pond is filled—say the second year—the differential breeding habits of these two species as to locality are the same as observed at Parr Shoals and at the Coosa Pool it will be decided in the affirmative. Examination of the surrounding country, beyond the possible influence of the pond, to determine the production of A. quadrimaculatus therein, should also throw light upon the subject. The observations at Eau Clair, not made for this purpose, and at Shelby are on this line. Possibly the presence of the small number of A. quadrimaculatus in the drift in Cedar Creek on the Coosa River may mean that they were from side pools or small marshes very far from the pond washed down on floatage. This creek was very large and long and bold and this could happen.

It is well known how Aédes calopus, with her strong preference for artificial containers, accommodates herself to available breeding places. Remove artificial containers, gutters, etc., and she takes the axils of leaves and other out-of-the-way places. Then put out a few buckets of water—"trap breeding places"—and the eggs will be deposited in them to the exclusion of the out-of-the-way and, I presume, less eligible places. It is then in accordance with analogy that A. quadrimaculatus should also show a similar preference for eligible breeding places, abandoning other less eligible places for them.

It is to be noted that in the neighborhood of the Coosa Pool A. quadrimaculatus were found breeding in two large pools examined outside of any pond and in a large cement tank with algae in it.

REPORT ON TYPHOID FEVER IN BIRMINGHAM, WITH RECOMMENDATIONS FOR ITS ERADICATION.

By L. L. Lumsden, M.D.,
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(Editor's Note.—In Birmingham, beginning the latter part of June, there occurred an explosive outbreak of typhoid fever and in thirty days nearly 500 cases were reported. While not a large number of cases for a city of 175,000 population, the health authorities proposed to stop the epidemic and to permanently eradicate the disease from Birmingham and Jefferson County. A request was made to the United States Public Health Service to detail its chief typhoid expert, Dr. L. L. Lumsden, who is regarded as the greatest typhoid epidemiologist in the world, to come

to Birmingham to study conditions and to make recommendations for permanently freeing the city and county from this disgrace.

The cause of the outbreak in Birmingham was traced to ice cream from a large factory, a part of whose milk supply was obtained from an infected dairy. The epidemic was therefore promptly controlled by closing down the ice cream factory and by requiring all ice cream manufacturers to pasteurize the milk and cream used in their products.

This epidemic, with the intelligent and widespread publicity given to it by the Birmingham newspapers, has been the cause of awakening public opinion to the need of an adequate public health department for Birmingham and Jefferson County. The Board of Health has requested another U. S. Public Health Service expert, Dr. Carl Fox, to be sent to Birmingham to reorganize its entire health system, in accordance with the laws of Alabama.

The report by Dr. Lumsden on the situation in Birmingham is a classic on the causes of, and the methods for preventing, typhoid fever. The system of investigation employed by Dr. Lumsden and his associates, and his recommendations for preventing typhoid, would apply to any city or county. It is for this reason that we publish the report in full.)

To the City Commissioners and the Members of the Board of Health of Birmingham, Ala.

Gentlemen—In accordance with your request, I have made a study of conditions known or suspected to influence the spread of typhoid fever in the city of Birmingham, and I respectfully submit the following report of findings with certain conclusions and recommendations:

My studies of the situation have been conducted in active co-operation with representatives of the city and the State Health Department. This investigation was begun on the 10th instant, and has been conducted with a view to determining as definitely as possible not only the causation of the recent outbreak, but also the causation of the high rate of prevalence of typhoid fever obtaining annually in this city and its vicinity so that preventive measures of a permanent character may be indicated. The investigation has comprised a survey of general sanitary conditions affecting the water and food supplies, observation of methods of collecting and disposing of refuse matter, and a detailed study, including a visit to the homes, of 300 of the 451 persons reported to have typhoid fever between June 1 and July 18. The data obtained from the special investigation of these 300 cases can be accepted as representative of the whole group of cases reported in the outbreak.

The Recent Outbreak

June, July and August are usually, according to the records, the months of highest prevalence of typhoid fever in Birmingham. The number of cases reported from June 1 to July 18 for previous years averages about 113. The number reported in this period of 1916 was 451. Thus there has been in the recent outbreak or epidemic an excess over the usual of about 238 cases. According to the dates of development of cases the outbreak began about June 9, progressively increased to reach its maximum about June 28, continued high until about July 6, and since July 6 has been rapidly diminishing. The period of causation of the outbreak proper extended apparently from about May 25 to June 25.

In the period of the outbreak the disease was generally distributed throughout the city, and affected all classes of persons. The case incidence was particularly high, however, among children between 5 and 15 years of age in families living under prosperous circumstances. This fact, taken with the geographical distribution of the disease and the other epidemiological features of the outbreak, suggested that some food or beverage extensively distributed in the city, and eaten especially by children of families able to provide more than the necessities of life, was the chief medium of conveyance of the infection.

Among the possible media of conveyance of typhoid infection to be suspected in an outbreak, such as the recent one in Birmingham, are (a) water supply, and (b) food supply, including especially milk and milk products.

The Water Supply

Water Supply.—It is estimated that over 90% of the inhabtants of Birmingham use for drinking water which is obtained solely, principally or occasionally from the public supply. Therefore, if the public supply should be infected a large proportion of the population would be exposed. According to the results of the field and bacteriological examination of the public water supply, this water during the period of causation of the outbreak was free from evidence of dangerous contamination, and, according to the geographical distribution of the disease and the other findings from the investigation, there is no indication that the public water supply was a factor in the causation of the excessive number of cases constituting the recent outbreak of typhoid fever in Birmingham. Though the public water supply is obtained from rivers which are exposed to considerable pollution, the equipment for purification of the water appears adequate, if properly operated at all times, to insure the safety of this water as it is delivered to the consumers. There are in Birmingham a number of wells and springs used as sources of water for drinking. Most of these are exposed obviously to pollution with human excreta and other refuse matter. Water from them is dangerous, and unless previously subjected to adequate purification process should not be used for drinking or culinary purposes. The water from these wells and springs probably operates to some extent every year in the conveyance of typhoid infection.

Milk.—In the recent outbreak the cases of typhoid fever were distributed among the customers of a large proportion of the dairymen distributing milk in Birmingham, but there was no disproportionately large number of cases among the customers of any of the dairymen, and there is no indication that milk as such was an important factor in the conveyance of the infection responsible for the outbreak.

Inadequate Inspection

In view of the inadequate inspection service, the progress of sanitation, and the adoption of cleanly methods at the dairy farms is surprisingly good. Further progress in this direction is obviously indicated. Under existing conditions the milk supply is likely at any time to serve as a factor in the conveyance of typhoid, tuberculous and other infections, and therefore, public and private (home) Pasteurization of milk should be encouraged.

Ice Cream.—Of the 300 cases specially investigated, 269 gave a definite history of having eaten ice cream within the three weeeks prior to onset of illness; 23 gave a definite history of not having done so, and for eight the ice cream history could not be definitely obtained. Of the 269 users of ice cream, 163 gave a definite history of having eaten within the three weeks prior to illness ice cream which had been made at one of the larger ice cream factories in Birmingham. It is estimated that this manufacturer (Manufacturer "X") supplies about 20% of the ice cream consumed in Birmingham. The consumers of his ice cream furnished about 55% of the cases occurring in the outbreak. Less than 33% of the cases can be fairly definitely excluded from the users of this ice cream. Among the users of ice cream from sources other than this, the number of cases were roughly proportionate to the amount of ice cream produced. Of the 163 cases giving a history of having eaten ice cream made by Manufacturer "X," 146 gave a history of not having used ice cream from any source other than this. No other ice cream manufacturer in the city had among his customers more than 11 cases, which gave a history of having eaten within the three weeks prior to onset of illness ice cream obtained exclusively from his supply. The excess of cases among the consumers of ice cream made by Manufacturer "X" corresponds fairly closely to the excess of cases over the usual for the period, and constituting the outbreak.

Manufacturer "X"

If the case incidence among the users of ice cream made by Manufacturer "X" had been the same as that among the users of ice cream from all other sources, there would have been in the period, June 1 to July 18, 1916, only about 70 cases in excess of the average number reported for the corresponding period in each of the six years, 1910-1915.

Besides the excess of cases occurring in Birmingham among the users of ice cream made by Manufacturer "X," outbreaks synchronous with that in Birmingham have been reported from several other communities in Alabama among persons who within the three weeks prior to onset of illness had eaten ice cream from this same source. Typhoid infection in an ice cream supply may have its origin in human excreta introduced into the cream by fingers, flies, water or other agents at (a) the dairy farm, (b) on the way from farm to factory, (c) at the places at which containers for the ice cream and ingredients other than ice cream are prepared or handled, or (d) at the factory. For an outbreak attributable to ice cream borne infection of the extent and with the characteristics of that recently occurring in Birmingham, the suggestion is strong that infection has reached the cream or milk some hours (long enough to permit considerable multiplication of the typhoid germs) prior to the freezing of the cream. In this connection it is significant that one of the dairies already inspected among those supplying milk and cream to Manufacturer "X" is located in a neighborhood in which typhoid fever was highly prevalent in May and June of this year. Some of the homes in which the typhoid fever cases existed are located within 300 yards of the dairy house. From the official report on the general sanitary conditions at those homes in particular respect to excreta disposal, and at the dairy, it may be readily understood how typhoid infection may have reached in any one of several ways the milk and cream shipped from that dairy to Manufacturer "X" in the period, May 25 to June 25, 1916.

Conclusions

1. Cause of Recent Outbreak.—The markedly excessive prevalence of typhoid fever in this city during the past six weeks was, beyond reasonable doubt, caused in large part by infection conveyed in ice cream made and sold by one of the manufacturers of ice cream in Birmingham. From a survey of the evidence in respect to sources of ingredients and processes of manufacture, it apparently was a matter of chance that infection was extensively spread through the ice cream supply from this source instead of the supply from some other source or sources. The infection in the ice cream may have been introduced at the factory, but the preponderance of evidence is that the infection came in the milk or cream from some dairy or dairy farm outside Birmingham. As a rule, the chances for the spread of typhoid infection through milk or milk products are greater for milk as such than for ice cream. A rigid observance of the provisions of ordinance No. 403-C, approved July 18, 1916, should insure that the ice cream supply of Birmingham is a reasonably safe food for human consumption, and much safer than is the ice cream supply of the average American city at the present time. Though the predominant factor in the spread of the infection responsible for the excessive number of cases of typhoid fever in the recent outbreak was an ice cream supply, local factors other than ice cream also were operative in the causation of the disease occurring in the period June 1 to July 18. Many of these other factors are operative to a greater or less extent every summer in Birmingham. The prevention of their operation is feasible, and is a matter of vital importance to the city of Birmingham. With the unusually large number of foci of infection now existing as a result of the outbreak, the enforcement of general sanitary measures in this city is now especially indicated.

Control Measures

2. Control Measures.—The prompt and vigorous action of the city officials in the inauguration of measures for the control of the recent outbreak of typhoid fever is highly commendable—particularly is this true in view of the financial embarrassment of the city government at the present time.

3. Publicity.—The publicity recently given through the local press and other agencies about the causation of typhoid fever in Birmingham has been of an excellent character, and should have a marked effect in fostering the development of the public sentiment necessary to the accomplishmen' of permanent sanitary improvements in a community.

4. Usual Prevalence of Typhoid Fever.—According to the records, typhoid fever is highly prevalent every year in this city. Here it is largely a summer disease.

With a typhoid fever death rate per 100,000 population of 40.2 in 1914, and of 33.7 in 1915, Birmingham stands at the bottom of the list of American cities with populations ranging from 125,000 to 200,000 rated in order of lowness of typhoid fever death rate. The typhoid fever rate in this city can be reduced to a practically negligible figure by measures like those which have accomplished this in many other cities.

Causes of Typhoid

5. Causes of Typhoid Fever.—Typhoid fever is caused by infection which reaches the human body by being swallowed. The infection has its origin in the excreta (stools and urine) from the bodies of infected persons. The infection may be spread by fingers, flies, foods, water or anything else contaminated in the slightest degree with human excreta. According to the evidence the greatest single source of typhoid infection perennially distributed in Birmingham is the open, insanitary privies, of which it is estimated there are 8,000 within the city limits. The prompt correction of these insanitary conditions appears to be the most important single sanitary measure needed in the city of Birmingham.

Recommendations

1. Water.—(a) Close all polluted wells and springs within the city—particularly those in the public parks—as soon as the extension of the mains for city water makes this feasible—in the meanwhile, post warning signs. (b) Offical supervision of public water supply to insure that this water will not at any time contain more than one colon bacillus to the 50 cc. (c) The adoption of such engineering projects as may be necessary to prevent at any time the overflow of sewage-laden water into any of the reservoirs in the public water system.

2. Milk and Milk Products.—(a) Enlargement of force of dairy farm inspectors sufficiently to insure a visit to each dairy farm at least once every 30 days, and to insure adequate supervision over milk depots. (b) Rigidly enforce ordinance requiring every one of the dairy farms to be provided with a properly installed, properly used and properly maintained sanitary privy or sanitary sewerage system. (c) Thorough measures to prevent flies and dirt from gaining access to milk throughout its course from cow to consumer (d) Prohibit the serving of "dipped" milk from delivery wagons. (e) Tubercular test once each year of dairy herds furnishing milk for city. (f) Encouragement of general milk supply. (g) Prohibit the sale in the city of any milk containing at any time more than 500,000 bacteria to the cubic centimeter, and containing after Pasteurization more than 50,000 bacteria to the cubic centimeter. (h) Enactment of an ordinance requiring that all butter sold or offered for sale in the city shall be made from milk or cream which has been properly Pasteurized and properly protected after Pasteurization. (i) Rigid enforcement of ordinance No. 403-C, passed July 18, 1916, for the safeguarding of the city's ice cream supply.

General Foodstuffs.—(a) Enforcement, as rigid as may be feasible, of ordinances Nos. 341-C and 361-C, for the protection of food for human consumption against dangerous contamination by flies, dust, fingers or other agents within the city of Birmingham, and the appointment as soon as practicable of a sufficient force of inspectors to carry out with a reasonable degree of adequacy the provisions of these ordinances. The enactment of an ordinance prohibiting the sale or the offering for sale in the city of Birmingham any green garden truck obtained from farms not provided with properly installed, properly used and properly maintained devices (either sanitary privies or sanitary sewerage systems) for the cleanly and safe disposal of human excreta.

Stable Manure.—Rigid enforcement of ordinance No. 206 to prevent breeding of house flies in stable manure.

Garbage.—(a) Rigid enforcement of ordinances requiring the proper use on all premises on which garbage does or is likely to accumulate, and remain for any length of time whatever of suitably constructed metal receptacles with well-fitted covers. (b) The adoption of measures to accomplish a separation of garbage from rags, waste paper, ashes and other refuse while in process of accumulation or storage for removal and disposal. (c) A discontinuance at once of the practice of recovering at the dumping grounds and crematories salable waste matter which has been mixed with wet garbage unless such matter can be made strictly sanitary prior to sale. (d) The use of covers on garbage wagons. (e) Increase of garbage incinerators so that the use of dumps within the city may be discontinued.

Excreta Disposal.—(a) Extend sewerage system as rapidly as practicable. (b) Require all houses within sewered area, without unnecessary delay, to be connected with sewer. (c) Adoption and rigid enforcement of an ordinance requiring all privies to be either abolished or made of sanitary type—the water tight receptacles for same to be furnished and owned by the city. (d) Radical improvement of scavenger service for removal and disposal of privy contents.

Sanitary Inspection.—The maintenance of a sufficient force of inspectors to carry out the sanitary ordinances of the city.

Infectious Cases of Disease.—(a) Requirement that all cases of reportable diseases be reported by card or letter. (b) The maintenance of a sufficient force of visiting nurses and inspectors to secure the exercise of reasonable precautionary measures at the bedside of cases of communicable diseases. (c) Continue free administration of typhoid vaccine as long as there is a large demand for same. Respectfully submitted,

L. L. LUMSDEN,
Surgeon, U. S. Public Health Service.
July 20, 1916.

SURGERY, GYNECOLOGY, OBSTETRICS AND GENITO-URINARY DISEASES

PENETRATING WOUNDS OF ABDOMEN WITH INJURY TO VISCERA. REPORT OF TWO CASES.*

By R. C. Dorr, M.D., F.A.C.S.,

Batesville, Ark.

Recognizing a time limit and that brevity is essential both in a paper and in its discussion, I shall try to confine myself to the title. I had hoped that the war now going on in Europe would give us some new light upon how to treat these cases. However, I am sorry to report that it has not, unless you consider a stab drain something new, which I do not.

First of all, I should like to quote to you what Prof. Tuffier[1] has to say upon this subject:

"There remains the always important question of wounds of the abdomen. It is one of the questions on which I count upon seeing a great deal of progress in the present war. From the very first I took a personal interest in these cases. I took up patients at the front with penetrating injuries of the abdomen and transported them in automobiles to a neighboring hospital, 10 kilometers from the firing line near Epinal, where I performed laparotomy. My results were bad: all the patients with injuries of the small intestines died. The question at present is to find out whether laparotomy is capable of giving satisfactory results in injuries of the small intestine.

"We must distinguish carefully in these cases between hemorrhages into the peritoneum, injuries of the large intestine and those of the small intestine.

"In the very numerous medical reports which I have read in the course of my inquiries among the physicians of the armies and of the ambulances at the front, the conclusion has been the same—that is, that patients almost always die after laparotomy when there is a wound of the small intestine. I estimate that thus far in the whole French army there are not so many as twenty wounds of the small intestine which have recovered after operation. But simple wounds of the peritoneum and those of the large intestine give very numerous favorable results. Let us look at the matter a little more in detail.

"The three methods are laparotomy with exploration of all the intestine, suprapubic incision, or expectant treatment. When the material conditions, operating room, rooms for the patients and personnel permit it, when they are in charge of a skilled surgeon and when the patient is brought in time and in reasonable general condition, laparotomy remains the method of choice. But these conditions are rarely fulfilled. The Health Service in France has made great progress in reference to equipment and movable operating rooms are installed at different points along the front, where all the conditions demanded in surgery in times of peace can be complied with.

"Suprapubic incision is indicated when there is an abdominal effusion or where a peritonitis has developed and a laparotomy can not be risked. The statistics given for this operation should be judged with some caution, for they profit by all the cases in which there have been no wounds of the intestine or where there has been simply a hemorrhage into the peritoneum. Therefore, if we wish to compare the results of the two operations, we must accept for the latter only those cases which have been followed by a fistula of the intestine. I have shown that these cases are exceptional.

"In all cases, drainage and the sitting positions are imperative. Expectant treatment is a last resort, but it has good results in countless cases. For my part I have seen abdominal injuries, including one at the eighth left intercostal space and three of fecal fistula that recovered perfectly. In all cases where asepsis can not be realized or where material or personnel is insufficient, recourse must be had to withdrawing food, immobilizing the patient in the sitting position, applying ice, and giving opium and subcutaneous injections of serum.

"Injuries of the kidney are rare and not particularly serious. At Auxiliary Hospital No. 20 at Saint-German-en-Laye, I performed two late partial nephrectomies for urinary fistulae due to lesions of the parenchyma of the gland; both recovered perfectly. I had to perform a total nephrectomy for a bullet wound of the kidney pelvis with encysted effusion, which I had previously opened."

I beg to submit the following, which has been taught in the leading text-books for years:

Wounds of the abdomen are dangerous in proportion to the amount of injury to the viscera.

For anatomical reasons, as a rule, injuries of the upper are less dangerous than injuries to the lower abdomen, for the

*Read in Section on Surgery, Southern Medical Association, Ninth Annual Meeting, Dallas, Tex., Nov. 8-11, 1915.

1. Theodore Tuffier, Paris, France, "Military Surgery," Surgery, Gynecology and Obstetrics, September, 1915.

reason it is not so apt to injure the viscera.

Penetrating wounds from the front are less dangerous than wounds from the side; for there is less danger of a number of wounds in the viscera. Exploration of the wounds, even aseptically, to determine the question of penetration is absolutely contra-indicated; for if the surgeon finds that the wound passed into the abdomen, he must then do a laparotomy. And if he is unable to enter the abdominal cavity through the wound, the failure is no evidence that the penetration has not occurred.

The two things one must keep in mind in the treatment of these cases are hemorrhage and sepsis; and their consequences, such as immediate death from loss of blood, and remote death from inflammation.

The first would call for immediate laparotomy in all cases. The second would also call for immediate laparotomy unless the environment and want of proper help would, in the judgment of the surgeon, be more dangerous to the life of the patient than a few hours' delay necessary to procure proper facilities and help.

Wounds of the large intestines are not nearly so serious as wounds of the small gut. In 47 cases reported in the Boer War, 13 died; mortality, 27.7%. In wounds of the large intestines, the death rate is about the same, whether the intestine is wounded intra-peritoneally or extra-peritoneally. An extra-peritoneal wound almost invariably results in fecal cellulitis, which goes on to suppuration or septicemia. The death rate in wounds of the bladder and rectum is about the same as in the large bowel.

In the Boer War, 35 cases were reported in which the small intestines alone were wounded; and of these, 62.8% died. The fact that one-third of the cases recovered is evidence that nature may be relied upon to a certain extent. When one considers the extreme danger of peritonitis following such injuries, the fact that so many recoveries occurred is surprising. In the 35 cases referred to, laparotomies were done in eleven; and of these, seven died.

The surgeons in the Boer War all report as convinced that operation is justifiable only when aseptic technique can be employed, or where the patient would unquestionably die if the operation were not done. Of course, in immediately operating upon these cases the main points are to close up the opening in the viscera and to control the hemorrhage. In some cases it may be necessary to make resections and anastomoses, and drain, if in the judgment of the surgeon it is needed, when injury to viscera is extensive. If you wait until general peritonitis sets up, then you operate to close up the opening and drain the peritoneal cavity.

I know of no exception in these where you would not use drainage; and I mean rubber tube drainage.

In these cases be sure not to disturb the viscera, except insofar as is necessary in closing the opening; for if you do, you break down the safeguard of the patient. The after-treatment is Murphy's slow saline per rectum, and nothing by the mouth.

Some authorities claim that if you wait until the third day to operate, it is hardly worth while operating at all. But that rule does not hold good now, as the following case will show:

In December, 1909, on Sunday, I was called to see Mr. B. at Elmo, Ark., who had been shot with a shotgun the night before at about 8 o'clock—size of shot, No. 3. He had between fifty and sixty shot in his legs, penis, scrotum and lower abdominal wall. The patient had some fever and a bad cold. It was hard for Dr. Wilson, the attending physician, and me to tell whether or not these shot had penetrated the lower abdomen. He had wisely refrained from probing.

Having no help but ourselves and the environment being bad, we decided to wait for developments. I returned home. On Monday night Dr. Wilson called me again; said our patient still had fever, a puffed-up board-like abdomen, was vomiting green material, and that he was satisfied that he had peritonitis. I went to see him Tuesday morning, taking a nurse with me. We operated at 1 p. m. The lower abdomen was full of pus, with plastic exudates all over it. I found an opening in the small bowel by pressing upon it to find where gas could escape. This I closed, putting a rubber tube drain low down in the pelvis. I stitched up the abdominal wound close around the tube and then started Murphy's slow saline drip and raised the head of the bed ten inches.

This patient made uninterrupted recovery and is living at the present date.

On December 29, 1914, Mr. R. walked into my office with his great omentum hanging outside his abdomen through a knife wound in the upper part of the upper left quadrant, and asked if I could do anything for him. After cleansing the omentum with 70% alcohol, I replaced it and

packed the wound (four inches in length) with iodoform gauze. I sent him upstairs to be prepared for operation. We went in immediately, and found that he had considerable internal hemorrhage with numerous clots, which were removed. Also there were two wounds each about one-half inch in length in the small intestine about five feet from the stomach, with the mucous membrane everted, which I ligated with cat gut and trimmed off short. The rest of the wound was closed with two rows of Lembert's suture.

I put in gauze drains at the upper and lower angles of the wound, and later removed them on the fifth day. I elevated the head of the bed twelve inches and started Murphy's drip, allowing nothing in the stomach for three days. He left the Sanitorium entirely well on the fourteenth day.

DISCUSSION.

Dr. C. P. Meriwether, Little Rock, Ark.—I do not know that there is anything new that I can say in regard to penetrating wounds of the abdomen. In those wounds with which I have come in contact that are due to stab injuries, my success has been 100%. In those cases of gunshot wounds operated upon, my mortality has been 100%.

Recently I had a gunshot wound with complete paralysis from the waist down, but there was evidence of hemorrhage, and I opened him up about two hours after the injury. He was shot with a 31-caliber steel jacket bullet, which we have been led to believe does the least possible damage. The lumen of the ileum was severed for three-quarters to four-fifths of its diameter; the mesentery was cut for a space of three inches close to the gut; and there was a second wound through the ileum, then on into the body of the fourth lumbar vertebra.

A resection was done in this case and about five inches of the gut were removed. He lived four days without any evidence of peritonitis, and died very suddenly. We were not able to get a post-mortem. But we believe death was due to an embolus.

Treves speaks of 40% recoveries of unoperated cases in the Boer War. He made his records from the base hospital, which was possibly five to fifteen miles from the firing line. He did not take into consideration the number of those who died as a result of hemorrhage, on the battlefield, or as a result of transportation. So I do not believe we can lay much stress on Treve's report.

I have had in the past year two cases of gunshot wound which I did not see for from twenty-four to forty-eight hours after the injury. One penetrated the bladder, causing a urinary fistula above the pubis, and one drained into the rectum. Nothing was done for him at all except keep him absolutely quiet, and he made an uneventful recovery.

Another case, about sixty hours after the wound, showed fecal matter coming out through the opening. He had eaten a very hearty meal about one and a half hours before I first saw him. I washed out his stomach, placed him in the Fowler position, gave him a Murphy drip, and administered morphine until his respiration was below 10. He made an uninterrupted recovery. I believe, had I opened him, he would possibly have died. However, I believe it the duty of the surgeon to operate upon all cases when seen early.

Dr. C. E. Cantrell, Greenville, Tex.—Inasmuch as they seem to desire to have an Arkansas discussion on this, I do not believe we should pass it up.

To know just what to do with this class of cases is a difficult thing. It seems now in the light of present-day surgery, where we do not think it is a crime any longer to open the abdomen even out in the country, under all circumstances if it is indicated, that gunshot wounds should not be left without opening the abdomen and seeing what can be done for the patient. If it is justifiable to open the abdomen for gunshot wounds at all, the earlier it is done the better it will be for the patient. In that respect it is analogous to obstruction of the bowel.

First day operation offers a great many more chances to the patient than does the second day, and the second day is equally as great over the third day. After the fourth or fifth day there is hardly any hope for a patient with obstruction, and the same is true of a gunshot wound if the patient has a peritonitis that is becoming general.

There are two or three things worthy of mention in connection with this discussion. Drainage of the abdomen is one. It has come to be very necessary that one understand the drainage and the localities of the abdomen that may be reached by drainage. Multiple drains, multiple tubes, even smaller tubes, are worth a great deal more than to undertake to depend upon one or two large tubes. Use small rubber collapsable tubes with gauze run through them (six, eight, ten, or even a dozen) down in an abdomen that has had the contents of the bowel spread over it.

One should always look for the destruction of circulation in the mesentery. If a bullet wounds the mesentery, it is much worse than if it wounds the bowel. Because if it cuts off the circulation from the mesentery, that section of the bowel is going to be gangrenous. So that if you find that the circulation is cut off in the mesentery, take out good, long sections of the bowel, wide of where it has been injured, sew up the ends and make a side-by-side anastomosis.

The doctor says that gunshot wounds from in front are much less dangerous than from the side. That is perfectly apparent. The reason for that is plain, because side-to-side wounds will almost surely wound either the ascending or the descending colon. The nearer the outlet of the bowel that is wounded, the greater the danger from infection.

Dr. M. Smith, Oklahoma City, Okla.—I think the doctor's paper in a great many instances very apropos. It has been my fortune, or misfortune, within the past two or three years to see many cases of gunshot wounds of the abdomen. And I think there are certain conditions and rules by which we may be able to form at least some definite conclusion as to the extent of that injury.

Now, for instance, less than three months ago a man came into the St. Anthony Hospital who had accidentally shot himself with a 22-calibre target rifle. There was very little shock; pulse about 80; respiration normal; and facial expres-

sion non-indicative of any material damage having been done. But upon opening the abdomen we succeeded in closing seventeen different openings of the small intestine. Nevertheless, he got well.

Another case, similar to this one, came in with profound shock, and with every indication of a great deal of injury having been done, when there was practically nothing in the abdominal cavity that would indicate such a condition as the symptoms presented.

As the doctor intimated in his paper, the patient's condition depends to a great extent upon the damage that has been done and to the amount of fecal material that has been turned loose. If the opening is of sufficient size to empty the intestinal contents into the peritoneal cavity, we will necessarily have shock in proportion to the amount of absorption.

Where you get a stab wound with a protrusion of the omentum without hemorrhage or interference with the circulation, it amounts to very little. Ninety to 95% get well where the mesentery has not been involved, and where there is no decided hemorrhage.

One other point in regard to the difference in the small and the large intestine. My experience has been that when the injury is to the large intestine, it is a vast deal more fatal than it is in the small intestine. I am speaking strictly of personal experience in the cases.

When a man comes under my care with an injury of the abdominal cavity, I want to know what has been done to the viscera. No man can tell just exactly how much injury has been done to the intestinal tract just from symptoms alone. I could cite many cases that would bear out this. If the blood supply is cut off from the intestine we all know that the remedy is an intestinal resection and an anastomosis.

Dr. F. G. DuBose, Selma, Ala.—When we have 100% of recoveries without surgery, and only 50% recoveries with surgery, then surgery is "in bad."

There are many conditions confronting the surgeon in gunshot wounds which make for or against possible recovery. I have been unfortunate enough to have many of those who have died, and some of those who have recovered.

One class representing those that had injuries necessarily fatal in the beginning consisted of liver injuries beyond the possibility of repair. I mean where the larger blood vessels were severed, where the liver was ruptured throughout the greater part of the organ, and where the patient was practically bloodless when brought to the surgeon. Those cases where the extensiveness of the injury previously precluded the possibility of recovery, and the other fatal cases are those seen after the first twelve hours. Those who are seen early and undergo immediate operation, in the absence of the necessarily fatal wounds, stand a remarkably good chance of recovery under prompt surgery.

During the past four years I recall four cases of gunshot wounds of the intestine which represent the stages I have suggested. One was shot in the right side, his liver ruptured transversely, just cracked open throughout its entire extent. Of course, there was no chance for this man from surgery or without it. One other had eleven wounds of the mesentery and gut. One had his stomach and his liver perforated. The fourth one came in with absolutely no symptom of shock or hemorrhage,—a great, big, strapping fellow, with the wound of entrance in his back, and the exit in front of his abdomen in the right side of the flank. He was told that his abdomen would have to be opened in order to determine whether he had a perforation of the intestine. He consented, and under local anesthesia the peritoneal cavity was opened and found to contain blood. He was then given a general anesthetic and a wound found at the hepatic flexure of the colon. The last three patients recovered.

When a man comes to the operating table in profound shock, and has added to that general ether or chloroform anesthesia, and has not had every measure used to combat shock at the time of the operation,—either transfusion or hypodermoclysis,—he has indeed a bad chance. When there is an element of doubt, open the abdomen under local anesthesia, and if necessary continue the operation under nitrous-oxid anesthesia in those patients who come in early. Do not let their well-being deceive you, and do not let the profound shock deter you.

Dr. R. W. Knox, Houston, Tex.—I want to emphasize the question of shock from penetrating gunshot wounds of the abdomen. It is generally conceded that most of these cases die from shock, due to the original injury, and accentuated by the anesthetic or the operation. If we can eliminate any form of shock the patient will have a greater chance of getting well.

In my opinion a combination of local anesthesia and spinal anesthesia will absolutely eliminate two of the three forms of shock. We are likely to overlook the fact that general anesthesia adds greatly to the shock of the operation. By blocking off the brain with spinal anesthesia there is no operative shock. In fact, it has a tendency to relieve partially the original shock due to the injury. I therefore believe that many of these cases would be saved if the operation for gunshot wounds were performed by local and spinal anesthesia instead of general anesthesia.

Dr. J. E. Thompson, Galveston, Tex.—There has been a great deal of confusion interjected into this discussion by confounding civil with military practice. In civil practice no one would think of raising any objection to early operation. It is incumbent upon every surgeon to operate at the earliest possible moment. Even in civil practice, some cases come under our care where days have elapsed since the perforation of the intestines, and where the condition of the patient makes an operation almost unjustifiable.

The military surgeon is very seldom able to operate upon his cases at an early date. As a rule, he does not see the patients in the first twenty-four hours; and very often a period of 48 hours or three days has elapsed before operation can be performed. When cases are seen at this late date, it takes a man of supreme judgment to determine what is the best course to pursue. In a manner they are analogous to cases of suppurative appendicitis with peritonitis, that come under observation on the third or fourth day. The average surgeon is betwixt the "devil and the deep blue sea,"—he does not know what to do. He believes that if he operates the patient will

die, and that if he refuses to operate, the patient will die likewise. The military surgeon deserves our sympathy when he refuses to operate where the risks are so appalling and the mortality so terrific.

One point has been brought out by Dr. Knox with which I am in full accord. In spite of condemnation from high quarters, spinal anesthesia has a very important place in surgery of this nature. The surgeon who refuses to use spinal anesthesia in grave abdominal conditions requiring operation, takes upon himself a very great responsibility. A general anesthetic in many instances will destroy the patient's chance of recovery. On the contrary, spinal anesthesia is absolutely life-saving at times. It renders operations simple that would be extremely difficult, if not impossible, under a general anesthetic. The abdominal walls are slack; the intestines lie perfectly inert in the belly cavity; there is no increased shock from the operation; and at the end of it the patient's pulse will be very much better than at the beginning. I have often seen a case snatched from death by the use of this anesthetic that doubtless would have terminated fatally under any other form of anesthesia.

Dr. Arthur E. Sweatland, Nacogdoches, Tex.—The operation depends upon when we do it, just as it does in a suppurative or perforative case of appendicitis. If we can get these cases early we have some hope of taking care of them with surgery. If we can not get them early we had better let nature take care of them.

My experience in gunshot wounds has been very unsatisfactory, 100% of the abdominal cases having died, whether I operated early or late. I have operated upon some of them early, and upon some of them twenty-four hours after injury, and they have all died. So they are dead ones when they are shot, so far as I am personally concerned. But I do recognize one point, and I believe Dr. Ochsner some fifteen years ago gave us this principle so far as injury to the peritoneum and abdominal contents are concerned: If we can not operate early, we had better let nature do what it can.

This does not mean that we should not arrest hemorrhage and relieve shock.

I shall expect to secure better results when I use spinal anesthesia or nitrous oxid-oxygen or both, for I believe that many times death is caused by secondary shock during operation.

Dr. W. B. Burns, Memphis, Tenn.—I want to raise the point that has been overlooked with reference to gunshot wounds in the military service,—Treves based his statistics upon that kind,—and that is the Mauser bullet wound. They do not wait because they do not get them in the hospital, but they do wait because of the knowledge that the Mauser bullet makes a little split wound which closes; and they found that perforating wounds of the intestine gave a better percentage of recovery by the expectant plan than by operative treatment. Those are not the wounds that we have in civil cases.

I take it that Dr. Dorr spoke especially of military wounds, although he reported some cases in his civil practice.

Of course in the wounds that we see in the hospitals around the cities of the South where the Negroes go out and take cocain and fill up at barbecues and shoot each other up with 44-caliber guns, you need not expect to find a little slit in the intestine.

The experience of those in the South who have operated upon these cases is that the earlier you get into the abdomen the better the chance of recovery.

I think in my service of four years at the City Hospital I got by in the four years with about 50% recovery, and the first year I got about 75% recovery. The next year I got about 75% mortality, the next year about 65, and the next year 45,—something like that out of about 40 or 50 cases.

I would never treat a civil case expectantly by any means. As Dr. Millington Smith has said, you can not tell what the conditions are going to be on the inside, and the question of what side or part of the abdomen is perforated is practically out of the question. I have never seen a perforating wound of the abdomen that did not penetrate the intestine from one to seventeen or eighteen times.

Stab wounds by knives, razors and other penetrating wounds aside from gunshot, have given me 100% recoveries. I have never seen one die.

Dr. J. A. Crisler, Memphis, Tenn.—I do not care to inject into this Association anything that would detract the minds of the members from the original paper.

I do not see why one bullet should be more dangerous than another except from the standpoint of infection. If the bullet makes a very small opening, of course the escape of fecal matter is more gradual, or possibly infinitely less than that caused by the big, soft-nosed 44 bullet that the Negroes shoot.

Two things operate in the production of death following a gunshot wound, and it was brought out by all of the gentlemen who have spoken. One is that the patient is practically dead when you get him and is in an inoperative condition from wounds that have been made into organs which you can not benefit by operation.

You may have an extensive laceration of the mesentery to such a degree that operation as far as recovery goes, is practically to be unexpected.

As for the infection element, permit me to say to you that here is a very great element to be considered in gunshot wounds of the abdomen, and one which we can likely prevent. I mention this to you gentlemen who have not tried it, to those, especially, who have no faith in it, and to those who have been losing 100% of their cases. Take these cases and wash the belly out thoroughly, everywhere, with a 2½% solution of iodine in 95% grain alcohol and they will not die of peritonitis.

I don't care to inject that into this body or bring in something that will cause any discord or cause a discussion of this subject and thus sidetrack Dr. Dorr's important paper. But I am merely stating a fact based upon a very large experience not alone of gunshot wounds, for I have not had such a large number of these (not, perhaps, so large as Dr. Burns, who is on a public hospital staff), but I have had a very large experience in treating infected peritoneums.

Hence I insist in those cases which you feel are going to die, use it and use it freely and liberally, and forget about adhesions and absorption; and you will have a different report to make when you talk on this subject again.

Dr. Dorr (closing).—The authorities tell you that the death rate is in proportion to the amount of viscera wounded. No man knows the personal resistance of the patient, and there is no way of telling it. Yet it is the thing that saves his life.

In regard to Dr. Crisler's method, I merely wish to say that if he will tell me how to determine the one that is otherwise going to die, I might try his treatment.

SURGICAL TREATMENT OF NEPHRITIS.*

By Russell E. Stone, M.D., F.A.C.S.,
Junior Surgeon, Touro Infirmary,
New Orleans, La.

Surgery, in its application to nephritis, trenches upon a field peculiarly the property of internal medicine. Medical men, since Richard Bright made known the disease which bears his name, have gone on treating patients suffering with nephritis without the remotest idea of any assistance from surgery.

The conception and the practical application of surgical operations to the treatment of nephritis we owe to the late George M. Edebohls, who reported his first experiences in the Medical News, 1899, LXXIV, 481. Edebohls, by accident, while doing a number of nephropexies in cases which at the time of operation and for a greater or lesser period preceding were known to have had chronic nephritis, noticed that these patients after the nephropexy would improve in general health and the albumin and casts would disappear. He then conceived the idea of treating nephritis surgically, and at a later date reported 178 cases.

In reviewing the history of renal surgery, I find that as far back as 1896 Harrison, Newman, Edebohls, Ferguson, Israel, Pousson and others found that albuminuria, co-existing with movable kidney, was cured by nephropexy and nephrotomy. To Harrison is given the credit for the first attempt to relieve Bright's disease by incision through the capsule into the parenchyma. His object was the simple relief of tension, arguing that an injured kidney is markedly assisted by removing the presence of extravasated blood, either within or surrounding the organ.

CLASSIFICATION.

One, in referring to some authorities, is bewildered by the numerous, complex classifications of nephritis. The pathology in acute nephritis, that is acute parenchymatous nephritis where the connective tissue frame work of the kidney is unaffected, shows there is the well known cloudy swelling of the tubules and glomeruli. In some instances the change is mostly glomerular. In such instances the urine is scanty, containing albumin, blood cells, and many casts; the chlorides are not well excreted and there is an accumulation of water in the tissues, known as edema, or in the body cavities, as ascites. If the tubules are much involved, then follow vomiting, headache, uremic convulsions, and in extreme cases, convulsions and death. Geraghty and Rowntree have shown that phenolsulphonephthalein is well excreted as long as the tubules are intact, but in the extreme cases in the last stages, scarcely at all.

Laboratory and clinical cases have demonstrated that decapsulation is followed by a new blood supply to the kidney which, arising from the perinephritic area, attaches itself to the denuded kidney. By this means the diseased renal tissues are gradually restored to normal. It is apparent that after medical means have failed to bring improvement we are, in certain selected cases, justified in treating the case surgically,—not with the idea of converting hopelessly diseased tissues into normal ones, but rather in hope that through drainage and relief of tension, cells not completely destroyed may be enabled at least partially to resume their proper function. It appears from a careful review that decapsulation and nephrotomy are entitled to a place in the treatment of nephritis. The success and value of the operation will depend entirely upon the care and judgment with which cases are selected. One should be mindful at all times that the immediate mortality must be high, and the use of the knife occupies the same position as do diuretics

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or hot baths. If not curative, it is at least a means indicated in emergency with a hopeful prospect of a cure or prolongation of life. It is not to be used until all other methods have failed; and when employed it must not be done indiscriminately.

The indications for decapsulation or nephrotomy are:

1. In toxic nephritis following acute poisoning by mercury or carbolic acid.

2. In nephritis following infection, especially the acute infectious disease such as scarlet fever, etc., where there is great edema; or in the presence of uremia, its use should be considered as soon as medical treatment has been thoroughly tried without relief. This is especially true in young adults and children.

3. In severe hemorrhage complicating chronic nephritis, when bleeding is practically limited to one side. In these cases a nephrotomy should be done to make sure of the exact cause of the hemorrhage.

4. It may be indicated for the relief of renal pain which sometimes occurs in the course of chronic nephritis.

5. It may be of value in uremia and anuria, during the course of chronic nephritis, merely as an emergency remedy.

6. In eclampsia, when the symptoms are due to faulty action of the kidney, and when improvement does not follow the delivery of the child.

7. Cases of movable kidney associated with albuminuria, casts and hematuria, where the urinary signs result from trauma incident to the mobility, may be cured by decapsulation and fixation. But when coincident with chronic Bright's, only temporary good is effected.

The following cases reported were operated upon. Gas anesthesia was used, but local (novocaine) anesthesia may be used satisfactorily if the patient is not water-logged. The operation is not a difficult one and can be done in fifteen or twenty minutes, that is, both kidneys, without any shock or complication, which is a distinct advantage with this class of patients.

TECHNIQUE OF OPERATION.

With the patient lying face down with a sand bag or Edebohls rubber bag (inflated) across the region of the umbilicus, this position renders the kidneys accessible to operation. An oblique incision is made from the twelfth rib to the crest of the ilium; the oblique muscles are drawn aside, exposing the retroperitoneal fat; Gerota's capsule lying under the quadratus muscle is punctured and the kidney exposed. The kidney is freed from its surrounding fat by a rapid, blunt dissection with the finger, and, if possible, lifted out of the wound. A delicate incision is carefully made along the dorsum from end to end, only cutting through the capsule. Each half of the capsule is gently stripped off the cortex and reflected back toward the hilum of the kidney, until the entire surface of the kidney is raw and denuded. The stripped off capsule is then cut away entirely, close to the hilum. If it is impossible to remove the capsule, it may be left and the wound is closed without drainage.

CASES.

Case No. 39335, Touro Infirmary.—Admitted September 5. Discharged September 24, 1913. Mrs. M. A., age 23. Referred by Dr. Hava, New Orleans, La.

Family History: Mother living. Father dead. Two brothers and one sister living. Father died of pleurisy.

Previous History: Measles during childhood. Otherwise negative. Menstruation regular once per month since sixteen years of age. Two children; normal birth. No miscarriages. Oldest child three years, youngest 13 months. Normal labors.

Present Illness: Six weeks ago patient noticed swelling of feet, especially in early morning. Later the abdomen began to swell, then gradually filled with water, and it became necessary for her to be tapped frequently. Had much nausea, vomiting and swelling of hands, feet and face. Very anemic and weak. Dizzy spells at times. Nose bleeding for the last three weeks. Eye symptoms negative. Bowels regular. Urine very scant, containing 65% moist albumin, hyaline, granular and waxy casts, and blood in urine. This patient arrived in ambulance at hospital with the above symptoms. The first 24 hours in hospital she passed ten ounces of urine, acid reaction, 64% albumin, hyaline and granular casts. For six weeks prior to admission this patient had a routine of medical treatment which is usually given this class of patients, and continued gradually to grow worse. She was kept under observation for two days, and was operated upon September 8. Decapsulation of both kidneys (gas anesthesia). The usual kidney incision made. Kidneys delivered and capsules removed. She was returned to bed without any evidence of shock or complications. The following twenty-four hours she passed 26 ounces of urine, and by the end of the first week passed from fifty to sixty ounces of urine. The albumin dropped to 20% and her general condition improved in every way. The edema and ascites disappeared entirely, and she was discharged on September 24

very much improved. After one month's time she was able to perform her household duties and has been apparently in normal health ever since she was operated upon, which was over two years ago. Her urine still contains albumin.

Case No. 44247, Touro Infirmary.—E. C., age 8 years. Admitted August 24. Discharged September 13, 1914. Referred by Dr. Hava, of New Orleans, La.

Diagnosis: Chronic Parenchymatous Nephritis.

Family History: Father, mother and one brother living. None dead.

Previous History: Measles, mumps and whooping cough. Influenza in December, 1912.

Present Illness: Ever since December, 1912, at which time he was suffering from influenza, he complained of severe headaches the greater part of the time. Feet and hands began to swell and abdominal ascites developed until he measured thirty-eight inches around the waist. Has suffered with nausea and vomiting constantly, and with dizziness. From December, 1912, to September, 1913, he had been treated by a number of able internists and given the usual treatment in this class of cases. Continued to go from bad to worse and was brought to hospital in ambulance. He had general anasarca, and was pale and anemic. He had an appearance of tallow over his entire body. Temperature 99°, pulse 128, respiration 40, with a systolic blow at the apex. He had been tapped repeated, and from one to two gallons of fluid removed each time. His condition was desperate and he was passing 1½ ounces of urine every twenty-four hours, containing 76% albumin, hyaline and granular casts in blood.

The operation was proposed to the parents and readily accepted. He was immediately operated upon, doing the Edebohls decapsulation under gas anesthesia. Both kidneys were delivered, which were very large and tense. Time of operation, twenty-one minutes. He stood it well and began to improve immediately, passing 13 ounces of urine in the first twenty-four hours, with 70% albumin; passing 30 ounces the second twenty-four hours, and on the fourth day 130 ounces. At the end of the first week he was passing between 40 and 50 ounces within twenty-four hours with a gradual diminution of albumin and casts. His general condition improved, his blood pressure gradually became normal, his appetite improved, and the swelling disappeared entirely from the body. At the end of three weeks he was practically normal and was out in the yard playing. It has been now about fourteen months since the operation and he is apparently normal in every way, but still has albumin in his urine.

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DISCUSSION.

Dr. C. E. Cantrell, Greenville, Tex.—Even if the surgeons of this country have not adopted Edebohls' course and plan of operation, there are some cases in which surgeons could derive great benefit by following that practice. For instance, in the acute cases of eruptive fever, or where there is suppression of the urine in obstetric cases, even if one can not subscribe to operating upon old cases of Bright's disease—the cases in which Edebohls operated upon and in which he reported such brilliant results. We ought not to conclude that we should not operate just because they are going to die. They might live longer if left alone unless a successful operation is done. We have been doing this Edebohls operation for quite a while, and now have something more than fifty cases. Nearly all are improved. There were very few deaths.

A young railroad man, a check clerk, was thrown from the side of a car. In about four or five days he had congestion of the kidneys, and seven days afterward complete suppression for several hours, very little urine for twenty-four hours, and convulsions. He was put upon the operating table. Very much swollen capsules, and the kidneys could not work because of the tension. Such cases as those are easily operated upon, as the essayist says. Plenty of urine the first twenty-four hours. The man made a good recovery.

That kind of case will be perfectly well. The old cases will not do so well. You know the capsule of the kidney is just like fibrous tissue in any part of the body. The only property it has outside of holding things together is to contract when it is inflamed, and it cuts the blood out of the kidney and becomes so tense that there can be no action. Split it, if you do nothing else. But do not go into these old cases.

Many times you can not get the kidneys up out of the incision. If you can not and can see what you are doing, why, remove the capsule by splitting it with a knife, or any way you can, and let new blood into the kidney. You can not relieve them in any other way.

Dr. W. W. Crawford, Hattiesburg, Miss.—Appreciating, as we do, that trauma is a source of suppression, it seems advisable that a double decapsulation should not be done in any given case. I should think a very much better way, and that most advantageously followed, would be to decapsulate one kidney, and when you have had a perfect restoration, at some later date decapsulate the other kidney. I can attest the consistency of this view in at least one case.

Dr. Stone (closing.)—This operation should not be done indiscriminately. In diffuse nephritis and in granular kidneys it is not indicated. It is only in the immense, swollen kidneys that it is of value.

SURGERY OF THE COLON.*

By Fred Y. Cronk, M.D., F.A.C.S., Guthrie, Okla.

In the limited time of this paper it is not practical to go into a discussion of the colon in all its phases. We shall,

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therefore, limit our remarks to emphasizing special conditions and phases of colonic disease. All phases of abdominal surgery have broadened, and ultimate results have been more gratifying during the past few years. If you will note, this advancement is the outcome of more careful study from the anatomical standpoint interweaving anatomy and operative surgery. In considering the colon, our most important factor is that of an adequate blood supply to any part which may remain after operative manipulations. Again, the lymphatic system presents a picture by which we may judge ultimate results and to a degree guide our knife in an attempt to eradicate the disease.

Our first consideration is early diagnosis. Cancer, a most dreaded disease, when found early is invariably curable. The big problem for us is to get the disease when symptoms first appear. Early treatment promises success and is most gratifying to the surgeon.

In cancer of the colon a history of preoperative obstruction is obtained in approximately 65% of the patients, as emphasized by McGlannan in a study of 98 cases. Of these cases there is a mortality of approximately 60% (from the literature since 1900). Of the cases not complicated with ileus, the mortality of recent years is from 10 to 12% as compared with 25% up to five years ago. In a series of over 700 cases of cancer of the colon (studied by R. Bastianelli, Rivista Ospeda liera, Rome), only 29 have survived for three years, and only 10% were permanently cured. Among this series one, two and three-stage operations were performed. Within the last two years the one-stage colectomy is the method of choice, as summarized from the results of various surgeons, and should be done except where intestinal drainage can not be established through natural channels before operation.

A patient in question, as you will note from the following history, showed signs of definite obstruction and only by repeated efforts were we able to establish what we considered satisfactory drainage.

Mrs. E,. No. 692, age 69, married. Entered the hospital in May, 1914, complaining of pain in the bowels (continuous) and constipation. Family history unimportant. Personal history: Menopause at 46. General health good. Always constipated. Six months ago (December, 1913) patient had an attack of abdominal cramps and vomiting; relieved by enemas and medicine. Three months ago (March, 1914) was in a hospital for similar condition. Again relieved by enemas. During the two months following her stay in the hospital she relieved this abdominal pain and discomfort by repeated enemas, the attacks coming on every one to two weeks. During the past month the patient has used enemas every one or two days and the abdominal pain has remained almost constant. There is no jaundice and no urinary disturbance. Patient has lost about twenty pounds during the past six months. Eats small amount of food, as it causes abdominal disturbances.

Examination: Good color, blood pressure 160 (diastolic). Heart and lungs clear. Slight general abdominal tenderness. No mass visible or palpable. Bimanual and rectal examinations reveal no masses and no tenderness. With repeated enemas every day patient has kept fairly comfortable and is able to eat a moderate amount of soft food without a great deal of disturbance. Partial intestinal obstruction due to a malignant growth, was a provisional diagnosis and exploratory laparotomy suggested.

Operation May 20, 1914, under ether anesthesia; median high incision; resection six inches transverse colon with omentum, etc., followed by lateral anastamosis (double thumb method of Bloodgood), with inverted ends stitched in wound. Small protective drain.

Operative Note.—Tumor was an adeno-carcinoma (annular) of the transverse colon, the lumen of which would just admit the end of a slate pencil. The tumor was practically free of adhesions. The omentum contained enlarged glands. A margin of about one-half inch was left on either side of the tumor. Bowel was divided between clamps by cautery. The divided ends closed with cat gut and silk and the double thumb anastamosis made in the usual way.

Recovery was uneventful until the end of the second week, when the gall bladder, which was full of stones, began giving quite serious trouble. Through a right rectus incision the stones were removed and drainage was established. Convalescence was slow following the second operation. There was also some drainage from the proximal end of the divided colon beginning about the eighth day. The gall bladder drainage continued until August. By this time the patient had gained considerable strength and was ready to leave the hospital. Drainage from the bowel was small in amount. After leaving hospital patient did not return until December, when the fistula was permanently closed. Patient is now well, eighteen months following the operation.

I wish to emphasize the double thumb (method of Bloodgood) anastamosis for the reason of frequent leakage following large bowel sutures. By bringing both ends of the anastamosis up into the wound the operator is relieved of that suspense of intra-abdominal pus pockets should he use the end to end, lateral or Murphy but-

ton method. The slight leakage, in the case just reported, gave us practically no concern, as it immediately made its appearance on the abdominal wall and the patient felt practically no inconvenience.

A second patient, Mr. A. J. A., No. 857, age 55, married, complained of pain and swelling in the right side of the abdomen. Family history unimportant. Personal history: Strong man until three and and a half years ago, when he suffered an acute attack of pain in the right side of the abdomen, about the level of the umbilicus. There was nausea but no vomiting. Does not remember intestinal condition. Diagnosis of kidney trouble made at this time. One year later had a similar attack, when there was a palpable mass in the same region, supposedly the right kidney, though the urinary examination seemingly was negative. One year ago patient felt a mass in the right lower abdomen about the region of McBurney's point. This was slightly tender. At this time there was no acute attack, and no fever. Patient experienced considerable difficulty in lying on right side. There was a diagnosis of appendix abscess. During the past three or four months this mass has constantly ached and now has a burning sensation. There has been constipation, but no history obtained of intermittent diarrhea. Has lost about thirty pounds in the last six months. Diet is limited, as food causes some abdominal uneasiness. Ten days ago patient had a rough ride in a lumber wagon, after which he experienced severe pain in the abdomen and marked tenderness of this mass. This continued for about a week, necessitating the patient to remain in bed most of the time.

Examination: Emaciated man, pale, loud systolic murmur heard all over cardiac area with an occasional skipping of pulse beat. Blood pressure 90 and 120. Lungs clear. Abdomen scaphoid. Mass size of small cocoanut in the right lower quadrant. The mass is firm, quite tender on pressure and is more or less movable. There is much gas in the intestines. Provisional diagnosis: Carcinoma of the head of the cecum. Patient was allowed to remain in hospital four days.

Operation, under ether anesthesia; long right rectus incision made. Resection of two inches of the ilium, cecum, ascending colon and the hepatic flexure. Lateral anastomosis ileum to transverse colon, double thumb method.

Operative Note.—The mass was free from all parietal peritoneum except at the posterior fold behind the ascending colon. These adhesions passed posteriorly, and held the hepatic flexure in close contact with the duodenum, gall bladder, and a little lower held a loop of the upper ileum in close contact with the mass. The loop of bowel was easily separated, though the dissection in the region of the duodenum was very tedious. The mass was contracted upon itself in such a way that it was impossible to follow the course of the bowel except by dissection of the mass after removal. One could hardly imagine how food might pass with so few signs of severe obstruction. The great omentum was also included in this mass, which necessitated its removal. There were a few enlarged glands in the region of the duodenum, which I was able to remove, otherwise I was unable to palpate any glandular involvement.

The ends of the bowel were closed with cat gut and silk and an ileocolic lateral anastamosis was done. Small tube drain was removed from the wound on the third day. Small amount of serum drainage only.

Patient made an uneventful recovery, and is now comfortable, eight months following the operation. Has gained between 30 and 35 pounds.

This is purely a case of delayed surgery due, not so much to the ignorance of the patient as to the mistaken diagnosis and lack of persuasive powers for exploratory operation on the part of the physician. How long this man will remain well is a question. However, from present appearances one would consider him a cured case. What we have thought about is the comfort of the patient, whatever else may intervene.

In conclusion, I would like to emphasize the importance of early exploration. One may not be able to establish a definite diagnosis in all cases, but we can be sure whether or not an operation is indicated, and if we shall gain the confidence of our patients they will, with a very few exceptions, grant us permission to treat them as we deem wise, and when the disease is in a curable stage. The public is learning to attack tuberculosis in its incipiency, and yet cancer kills almost twice as many people in a year as tuberculosis. One must talk cancer and write cancer for the good of humanity.

LOCAL ANESTHESIA*.

BY HERBERT P. COLE, M.D., F.A.C.S.,
Mobile, Ala.

We have been interested in local anesthesia from the standpoint of adding to our armamentarium a method of applying anesthesia to certain patients where local anesthesia is imperative.

I wish to emphasize that local anesthesia is an implement of great value in cases which cannot be safely operated upon by any other form of anesthetic. Local anes-

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thetic methods will be a certain factor in the reduction of mortality in grave surgical risks.

(1). I am illustrating upon the screen a case in which complete radical amputation of the breast was performed under local anesthesia for carcinoma in a woman sixty-one years of age suffering from chronic nephritis. A brachial plexus injection is performed. Then perineural infiltration is performed on the upper posterior seven intercostals and a local infiltration is made over the clavicle and along the sternum of the same side. We have performed three cases under this method of anesthesia.

(2). I now show upon the screen a complete decompression for epilepsy under local anesthesia. The patient had an epileptic convulsion during the operation. The anesthesia was entirely satisfactory both to the patient and to me.

(3). Next upon the screen I show a decompression of the skull and the frontal region, with the removal of a tremendous osteo-chondro-myxoma. This involved the removal of a large portion of both frontal bones and a part of the parietal bone with an area of dura four inches in diameter. Drainage through the frontal sinus. This patient made a splendid recovery and the anesthesia was excellent.

(4). Next upon the screen note the photograph of a Littre anus established in a child three days of age under local anesthesia. This child who was starved for several days before the operation and given the bottle during operation paid little attention to the local anesthesia.

(5). Next upon the screen note a case in which we performed complete nephrectomy for a large adenoma of the kidney in a woman over fifty years of age. This has been performed several times in this country. Dr. Allen of New Orleans reported a case before the Association a year ago.

(6). Next upon the screen note the photograph of a seventeen-year-old girl from whom I removed a forty-three pound ovarian multilocular cyst under local anesthesia. Local anesthesia was selected because of a marked dislocation of the child's heart and the presence of an active nephritis. The child made an uneventful recovery and is perfectly well today.

(7). I next disclose a woman eighty-one years of age with a sarcoma of the eye. Complete eccenteration of the orbit was performed under local anesthesia. In addition to the usual technique of removal we avulsed the supra- and infra-orbital nerves cleaning out these fatty canals to prevent the recurrence of malignant growth. The eccenteration was performed with splendid anesthesia. There was a recurrence of sarcoma elsewhere in the body six months later.

Very extensive work under local anesthesia has been carried on in Europe. The general field of surgery has been largely invaded by local anesthetic methods. In this country so far as I am aware complete amputation of the breast, decompression for epilepsy, and eccenteration of the orbit under local anesthesia, have not hitherto been reported.

My methods are taken entirely from Braun, to whom all credit is due in the work under local anesthesia, likewise, to Dr. Allen, of New Orleans, in this country.

Van Antwerp Building.

DISCUSSION.

Dr. Lucian H. Landry, New Orleans, La.—Dr. Cole's paper is of great interest to us. We do a great deal of local anesthesia in New Orleans, and it is a thing that we have been working upon possibly more than have many other clinics.

I would like to ask whether he uses any preliminary morphine or scopolamin before injecting the local anesthetic? That is what some of the writers insist upon. I mention that because we had a very bad scare some time ago in a radical breast amputation under local anesthesia. By mistake the patient was given gr. 1/50 of scopolamin. She was practically asleep on the table and also that night. We were very much worked up over it and she had some very good attention for a while; but she recovered. However, possibly a little scopolamin assists a great deal.

Another thing in local anesthesia is the age of the patient. The older the patient the better fit he is for local anesthesia. The neurons are not nearly so active as in young persons, and you can get better results.

Dr. F. G. DuBose, Selma, Ala.—They say a man is not without honor save in his own country. The essayist should have known that two years ago I read a paper on local anesthesia in major surgery before the Alabama State Medical Association, and therein practically all of the operations except the craniotomy were done, and when this one was put over, I wanted to know why. He said it was with the patient's consent and because he wanted to see if it could be done.

Local anesthesia is used too little, because it takes up too much time. All the refinements about nerve-blocking are useful, but are at times unnecessary. We should not confuse infiltration with intra-neural anesthesia. Ordinarily any

growth may be removed if you will circumscribe it with sufficient amount of quinine and urea solution concentration of one-fourth of 1% infiltration. If any nerves are met with they can be blocked off with 1% novocaine solution. The dissection can be done as well or even better under local anesthesia, because the time element is no essential with reference to the patient's safety.

Dr. Urban Maes, New Orleans, La.—I would hesitate to perform the amputation of a carcinomatous breast under local anesthesia. Having been drilled in the clinic of Dr. Matas, of New Orleans, I have adopted the neuro-regional methods in preference to the pure infiltration anesthesia, and have performed an endless variety of operations with this method. Only recently I have had the opportunity of doing a double decortication of the kidneys upon two patients with paravertebral anesthesia.

In hernia operations we have adopted the neuro-regional technique suggested some years ago by Cushing and Bloodgood. After studying a series of cases where pure neuro-regional methods were used and a like number of cases where infiltration only was used, I found that wound healing was materially influenced in the latter. In some instances almost 60% of the infiltration cases showed infection to a greater or less extent.

It is our custom to use 0.5% solution of novocaine with adrenalin, 5 m. to the first and three minims to each succeeding ounce.

Dr. Brookshire.—Please state the amount of Novocaine. Do you use it in any definite quantity?

Dr. Cole (closing).—I purposely left out nearly everything except the simple photographs because you are all familiar with the injection methods. To a large extent, it has become a routine with me in acute surgical abdomens with pus. In acute gall bladders, appendicitis, etc., undoubtedly a two-step operation may mean the saving of the patient.

Not knowing that Dr. DuBose had read a paper similar to mine, I was certainly not familiar with the fact that the doctor had reported these cases. However, I do not claim originality, but simply reported one or two cases that had not been published in this country before.

For blocking, a 1% or 2% solution, limiting the amount to 5 to 10 cc. is best. I use 3 drops of adrenalin to each ounce of anesthetic solution for infiltration. It is astonishing the amount of solution that can be used. I have used as high as 26 to 28 grains, where the incision was open, and a great deal of the fluid was released.

The preliminary use of scopolamin, 1/150 grain, and of morphine before operation is often essential.

Fortunately the aged patients are very good subjects for local anesthesia; and there can be no question that the procedure is much more valuable in the old adult than in the young.

I published an article upon this subject in the Florida State Reports in which I called attention especially to the different methods,—intra-neural injection, blocking, or combination of local anesthesia with the nerve blocking.

Dr. DuBose.—I would call it twilight sleep, plus nerve-blocking.

A NEW TREATMENT FOR CHANCROIDS

By Geo. R. Livermore, M.D.,

Professor Genito-Urinary Surgery, University of Tennessee; Genito-Urinary Surgeon, Baptist Memorial and City Hospitals, Memphis, Tenn.

The many remedies in use for the treatment of chancroids is conclusive evidence of the inadequacy of any one of them. It is now a generally accepted fact that chancroid is caused by the strepto bacillus of Ducrey, but that contamination with other bacteria is practically always present. In order to effect a cure it is essential to eradicate all infection. The actual cautery, nitric acid, etc., will often do this successfully, but if they fail a large amount of necrotic tissue is left that is both a protection and a fertile field for bacterial growth. A drug that will destroy the infection and not injure the tissue is ideal and the one that I wish to bring to the attention of the profession fulfills these requirements. This drug is Silvol, a new protein silver compound containing about 20% silver. It occurs in the form of dark brown lustrous scales, is hydroscopic and readily soluble in water.

The method employed in treating chancroids with Silvol, consists in cleansing the chancroid thoroughly with warm sterile water and then covering the entire ulcerated area with Silvol crystals. A gauze dressing and bandage are then applied and not removed till the following day. If upon removal of the dressing, the chancroid has not lost its virulent appearance, a second application is resorted to. When Silvol is applied to a chancroid there is a marked stinging sensation, but it is usually not severe and never lasts very long.

Although Silvol is not a specific and it is not suggested as the one sure shot, it is by far the best single remedy that I have used for the treatment of chancroids.

Exchange Building.

AUTHORS' ABSTRACTS.
(See page 748)

RAILWAY SURGERY

EDUCATION OF THE RAILWAY EMPLOYEE IN FIRST AID WORK.*

By A. C. Scott, M.D., F.A.C.S.,
Temple, Tex.

The largest percentage of railway employees may be grouped for convenience as follows: station, shop, transportation and track men. Of course, there are quite a number of miscellaneous men who do not come under these groups, but in undertaking any form of instruction it is impracticable to attempt to reach every man in the service.

Owing to the distribution of railway employees over a large territory, it is impossible and impracticable to group them for convenience of instruction except in a limited way. Another difficulty in the way of making effective First Aid instructions to railway men in Western railways is that a large proportion of the men are of a migratory type and for one reason or another are almost constantly changing. And also a by no means slight difficulty is the lack of interest in such matters on the part of those railroad men who have been in the service a long time and who have become more or less settled in their habits of handling their work. We have found it exceedingly difficult to get the older men to take an active interest in First Aid matters; they seem to take it as a foregone conclusion that they will not have occasion to wait upon any one soon and their interest is difficult to arouse and very difficult to retain.

Notwithstanding these facts, we believe that much more can be done than has been done; and just here we must make the confession that in our work along the Santa Fe line we have fallen far short of our own ideals in giving First Aid instructions.

Most office and station men are conveniently located in towns and cities where doctors may be had on short notice. Accidents among office men are so uncommon that it is not very imperative that they receive such elaborate instructions as men in other departments. It is not very practical to teach track and construction men very much in First Aid work, because the men working in these departments are constantly changing from month to month. Probably the best way to give instruction to them is to send each section and construction foreman a sheet of printed instructions accompanied by a letter from the division superintendent informing him that he must carefully read the instructions given and that he will be held responsible for the proper First Aid care in case of injury to his men.

Just twenty-three years ago we began our First Aid instructions on the Santa Fe Railway, at which time we attempted to give emergency service to our railway men by placing emergency boxes at all the shop centers, division superintendents' offices and upon all trains, both passenger and freight. These emergency boxes were of rather large size and contained the following articles:

1 dozen bandages varying in width from 2 to 3 inches,
5 yards sublimate gauze,
1 one-inch roll of adhesive plaster,
1 dozen safety pins,
1 triangular bandage,
Bichlorid of mercury tablets in a glass bottle, metal top,
1 ounce bottle of iodoform,
1 six-ounce bottle of bicarbonate of soda, and
1 small leather case, containing a pair of scissors, thumb forceps, artery forceps, needles and silk.

Very elaborate directions were given the railway employees relative to the uses to which the various articles might be put; report blanks were placed in each box, on each of which was a list of the articles; the users were given instructions to report on these blanks any time that the contents of the emergency boxes were used; and, by checking the articles used, the report blanks served as a requisition for the renewal of the supplies.

In order to hold some one responsible for the emergency boxes about the stations and shops, some responsible person was chosen to keep them under lock and key.

*Read before Southern States Association of Railway Surgeons, Auxiliary to the Southern Medical Association, Dallas, Tex., Nov. 8, 1915.

And in train service the boxes were placed in charge of conductors, who kept them in their regular train boxes. Each recipient of a box was required to sign a receipt and held responsible to the extent of $5.00 for the safe return of the box in case he left the service, or permitted it to be lost without properly accounting for it.

Of course, no one at the present time would undertake to equip a surgical package with some of the articles contained in the one to which we have just referred. The result of our mistakes soon began to show. Some of the boxes handled on the train were thrown about carelessly; and whenever the glass bottle containing iodoform was broken the whole thing was ruined and had to be disposed of. In like manner when the bichlorid tablets made their way through the metal top of their container, they also did a lot of damage to the contents of the boxes, and sometimes where sufficient atmospheric moisture existed, they made their way entirely through the metal boxes. Many of the railway men took the scissors home to their wives, and owing to the fact that various employees had access to the emergency boxes upon slight pretexts, if nothing but a little abrasion of a finger, it was found impracticable to make the holders of the boxes pay for the loss or misuse of certain articles which were found missing.

We did not limit our instructions to the printed instructions to be found in the top of every box; but at various times we held meetings with the men at the various shop centers, in which we gave them detailed instructions regarding the care of each other in all sorts of accidents common to railway employees. As we now look back upon the situation, we can appreciate many of the mistakes we made at that time; and we believe the most prominent mistake made was that of attempting to teach half-interested men, or wholly disinterested men, much more than they were able to grasp in a short period of time.

After several years' trial along these lines, we finally abandoned the large emergency packages and substituted a much smaller package containing only:

1 yard gauze,
1 oz. cotton,
1 2-in. gauze bandage,
1 3-in. gauze bandage,
4 safety pins,
1 Esmarch bandage, and
3 strips zinc oxid plaster, ½x12 in.

We limited our instructions to the care of the more common injuries resulting in hemorrhage, fractures, open wounds and crushed limbs. For many years we gave printed instructions in all the time cards used in the transportation department of the Santa Fe Railway. In recent years this has been printed in the railway company's book of rules and instructions; a copy of this is given to every employee who enters the train and engine service; and he is required to read it and be governed by its instructions at all times. Permit me to add in this connection that we think our printed instructions have been needing revision for some time; and it is our intention to do this at an early date.

We are in hearty accord with the instructions given by other railways and the American Red Cross Society in First Aid work with the exception of their instructions relative to the control of hemorrhage. We have seen many disastrous results follow the use of tourniquets in one form or another placed above the bleeding point in compound fractures, punctured and incised wounds and crushed limbs. We fully recognize the fact that our leading textbook writers still adhere to the old practice of controlling hemorrhage by placing constricting substances between the bleeding point and the body, but it appears to us that this idea should be abandoned, especially among trained First Aid workers who, being equipped with First Aid packages, can accomplish the desired results without increasing the danger of wound infection. The usual instructions to First Aid workers is to keep their hands and dirty clothes out of the wounds with a view to preventing infection. And they are no doubt well meant; but while there is a small element of danger of introducing some additional infection into the wounds by making pressure upon the bleeding point, that danger is nil compared with the dangers which arise from the application of tourniquets between the wound and the body sufficiently tight to result in complete hemostasis. As a rule it requires much more pressure to produce effective

hemostasis when applied above the wound than it does when the pressure is made directly upon the bleeding tissues. And when hemorrhage has been checked by this method, it nearly always happens that the constricting substance is allowed to remain in place until the patient reaches the hospital, or until such time as preparations have been completed in the home for proper dressing or amputation. In the event that the construction is made sufficiently tight to completely shut off the blood supply to the part, death to the tissues takes place; and consequently when the constricting band is between the wound and the body it frequently causes the loss of much more tissue than would be lost in case the constricting substances were placed directly upon the bleeding point.

It is a well known fact that shock may be induced or greatly increased by the presence of pain. In the case of crushed wounds, the injury not infrequently destroys sensation in the affected part and for the time being the patient is free from that element of danger. However, if the constricting band is placed upon uninjured tissues between the wound and the body sufficiently tight to shut off the blood supply and effectually control the hemorrhage, the resulting pain is of a very agonizing character and goes a long way toward the production of shock which may end fatally.

Our judgment is that the nearer the body is approached by the tourniquet when the patient is not anesthetized the greater the resulting shock will be.

For nearly twenty years when giving instructions in First Aid work, we have endeavored to teach our railway employees to control hemorrhage by making pressure directly upon the bleeding point. This pressure is usually made by placing a pad of gauze, cotton or a clean handkerchief upon the bleeding part, which is held in place by a roller bandage, which is wound repeatedly around the limb with increasing tension until the hemorrhage is entirely under control. If one bandage proves insufficient another is placed directly over it and wound more tightly, if necessary.

The especial advantage claimed for this method is that it requires much less pressure directly upon injured blood vessels to close every torn or incised opening than when pressure is made upon the trunk of vessels above the wound and by reason of the fact that the nerves supplying the injured parts have their conductivity more or less reduced. The pain from such pressure is not so great and consequently the patient is spared the additional danger from increased shock. Furthermore, in the event the pressure should be made by some irresistant material such as an inelastic suspender, bell cord, rope or rubber tourniquet, and be sufficiently great or retained sufficiently long to result in the death of the part, the resulting amputation will be confined to the immediate neighborhood of the injured part and not be made at some remote point between the injury and the body.

Many of the employees of the Santa Fe Railway have received some valuable instructions from Dr. Davis, the representative of the American Red Cross Society who has been traveling along the line and has stopped at many convenient points sufficiently long to give our men the benefit of the Red Cross Exhibits which are of special assistance to the "Safety First" movement, which is now receiving much attention by our Company.

We now have a movement on foot to organize, under the direction of our railroad Y. M. C. A., First Aid classes in each department at our two main shop centers, Cleburne and Temple. After they have had a thorough course of instruction, a competitive drill will be held for the purpose of stimulating further interest along these lines among certain selected employees at other division terminals and perhaps in the transportation department. We hope by this means to be able to create sufficient interest among the employees to make further instructions at other convenient points on the line much more effective.

Realizing that it is impossible to be prepared for every sort of emergency that may arise, we can appreciate the inclination of an enthusiastic surgeon to adopt First Aid packages providing for many different things that may become confusing when in the hands of most men. Where instructions are not in proportion to the number of things provided, they lose their

power for good and fall far short of the object for which they were designed. Therefore we are inclined to believe that more emphasis should be placed upon the method, the extent and character of instructions given than upon the articles placed in First Aid packages, the use of which may not be comprehended by the majority of men into whose hands they may be placed.

"First Aid Package," by Dr. R. W. Knox, Houston, Tex.; "First Aid to the Injured," by Dr. Duncan Eve, Nashville, Tenn.; "Treatment of Compound Fractures," by Southgate Leigh, Norfolk, Va.; and "Primary Treatment of Accidental Wounds," by Dr. Jos. C. Bloodgood, Baltimore, Md., read as part of the Symposium on First Aid and discussed below, were printed in the July issue of The Journal.

DISCUSSION SYMPOSIUM ON FIRST AID.

Papers of Drs. R. W. Knox, Duncan Eve, Southgate Leigh, Joseph C. Bloodgood and A. C. Scott.

Dr. Jos. C. Bloodgood, Baltimore, Md.—I should have an excuse to give you for coming before a body of railroad surgeons to discuss the subject of First Aid. I am not a railroad surgeon; I have not had much experience with accident surgery; but I have become very much interested in the question from perhaps more standpoints than has the railroad surgeon. Possibly the first reason I became interested in it was that I was in London when the European war broke out, and my thought, as did that of many other surgeons, naturally turned to military surgery. So interested was I, and also Mrs. Bloodgood, that if we had had no children I think that we would have remained there. Hence I have taken the opportunity to investigate military surgery.

I was asked to make an address in London on military surgery, because I was the only surgeon who had not fled home. I asked them for ten days, not telling them why, because I wanted to find out something about military surgery.

I devoted that time to the library, reading everything I could get hold of, in every language. The library was not very crowded, as most of the surgeons were busy in the preparation for the war, so that the librarian gave me two men, and I read everything I could find.

Many things have been reported before this Board. I am sorry that the men at the front did not read them before they went to the front. I went to the Red Cross and talked with surgeons about First-Aid methods, transportation, new methods of transfixing fractures, different types of ambulances, the stretcher carried by the hand, the stretcher made of canvas, and so on. They said: "Dr. Bloodgood, you must have had a very large experience in military surgery. You must have had a large experience in the Spanish-American War." I did not tell them that I had only seen six wounds and that they were all healed when I saw them. My only experience in the Spanish-American War was as a witness to my colleagues in looking for typhoid perforations.

I found that this extensive reading to a certain extent placed me ahead of the military surgeons. Frankly, the only reputation I have in London today is on military surgery, and yet it was gained by the application of my knowledge of operative wounds and operative surgery, with this concentrated attention to the experience of men who had been at the front.

So, when I returned to this country, it occurred to me to find out what condition we were in with regard to accident surgery and military surgery, and it led to the appointment by the Surgeon General of a board of officers to go over the Army First-Aid practice. And they immediately found that it was not modern and was not up to date. Therefore, it was revised.

One could easily see in the progress of our Army surgeon that the things he had developed were those which he had an opportunity early to see. And what was that? Sanitation. The reputation of the United States Army today is due to its sanitation. It has had no opportunity to develop any skill or knowledge from actual experience with wounds.

You know what sanitation has done in Havana and Panama; and you know the difference between the camps of instruction today and the camps of waiting in the South during the Spanish-American War. So you can see that experience must be helpful in the development of accident surgery. The Army surgeons have no opportunity for experience, unless we want to go to war just to give them that experience.

Now, what group of surgeons in this country have had experience with wounds? Railroad surgeons; surgeons to mines and manufactories; surgeons who come in contact with the laborers employed in certain occupations in which the danger element is great.

So it occurred to me to investigate the literature of railroad surgery. Gentlemen, it is conspicuous by its absence, as compared with the literature of gastro-enterostomy, of operations for gallstones, for appendicitis, and the larger group of what we might call "conservative surgery." This is no reflection upon the railroad surgeon, but there is no doubt that the literature today is not on accident surgery. Explain it as you like, that is a fact.

Then it occurred to me to look up First Aid. First Aid is an established thing in all armies. Upon what is it based? The experience of previous wars. What happens between the experience of previous wars and the present war? Great changes in surgery. Therefore, the army surgeon with no experience, or very little, is unable to make the change of the methods employed in a previous war and bring them up to date for a present war. Who must do it? Why, the accident surgeon, the civil surgeon.

If you will read over the First Aid books (there are over thirty) that have been written in English you will find that they are all different. They hardly agree on anything except the title, "First Aid." They are all too complex. They could all be burned up and no harm would be done. The

First Aid material varies all over the country. The adoption of First Aid Methods and instruction by railroads is present only in spots. There are few railroads in the country, but very few, that have paid any attention to it. So it occurred to me that it might be a good plan to have a conference—and whom did we turn to first? The railroad surgeon. It is a railroad problem. The railroad employs the largest number of employees who may become injured in spite of "safety first." We naturally turned to the Association of Chief Surgeons, or rather one of the chief surgeons—Dr. Gale, of the Norfolk and Western (we could not ask every railroad surgeon) and invited the chief surgeons. Then we had the American First Aid Conference. Dr. Eve has saved me from describing that.

The first day each man was given five minutes (I have here those transactions). There was very little agreement. We heard from the Army and Navy. Then we heard from the railroads.

The Secretary was invited to send out five questions to railroad surgeons throughout the country. Most of these questions were sent to chief surgeons, and they are now sending them to their associate surgeons. That is, we are attempting to make a survey of the experience of an army of men who really treat accidents, to learn the best method of treatment.

In the literature the men who really treat accidents do not write.

I can give you no opinion on First Aid. I rarely see an accident that has a dressing. The average time between an injury in a great city with its ambulance service and the time it reaches the hospital is less than an hour. The average result of the accidents that we see in a great city is fairly good.

Now, I want to say this: Gentlemen, you have a great opportunity, for many reasons. When they asked Dr. Royce, Professor of Philosophy at Harvard, to act upon a committee to investigate the methods of teaching at Harvard, some fifteen years ago, he said: "Gentlemen, I will not act upon a committee, but I will give you some good advice. Go West and study the conditions there."

What is the West? If you go to the Pacific coast they will say it is the Pacific coast. The West is undoubtedly the center of the United States, along the Mississippi River. And at the present time, for some reason or other, the progressive ideas of this country are originating along the Mississippi Valley.

Now, in a country in which the distances between cities is great, the difficulty of getting a patient to a modern hospital in a short time is great. Therefore, there First Aid measures are more necessary, and there you can study the effect of First Aid measures better than elsewhere. So, then, those parts of the country in which the distances between great cities or modern hospitals are greater are the parts of the country in which we can get the best evidence as to the real value of First Aid.

Another thing is happening in medicine, and you must all remember it. If any of you (to use a rather slang phrase) have a good thing in medicine, you have got to share it with all of your colleagues. If you have any opinion or any experience you have no right to remain silent.

We have heard in medicine, I think, too much from the minority and too little from the majority. I may be wrong. Here is an opportunity in investigating First Aid, to see if it is possible to make a survey of the opinions and the experience of the majority of surgeons who come in contact with accident surgery. We are trying to do that. I want you to help us.

We are sending these five questions to every chief surgeon. Every state association in the United States will soon have a committee of three to make a survey of its state. Every national association will have a committee to make a survey of the opinions of its association. We want to get in touch with every individual who has had experience with accident surgery, so that we may know something authentic about the condition of things for comparison before the First Aid is adopted.

That is where I am interested again. Here is a new method of attempting to standardize a certain problem in surgery and it is simplest here. If iodine is a good thing in the hands of the laity to disinfect a wound in New York, it is good in every state. And if it is not, it should be wiped out throughout the entire country.

As a matter of fact, if you ask the opinion of surgeons, they differ first as to whether or not the individual should be allowed to have an antiseptic; and they differ as to the antiseptic. After they have seen the wound themselves they differ as to the antiseptic they themselves use. Now, what does that mean? It simply means that the majority of us have no way of checking our results.

Lister started with carbolic acid; then came iodoform; next came bichlorid; afterward alcohol; and now we have iodine. We can read papers today in which the results claimed by different observers for carbolic acid, iodoform, bichlorid, alcohol, and iodine are equally good.

But we shall not go into that. However, there must be a method which gives the best results, and undoubtedly that is a simple method. There is such a method. Let's get it and test it all over the country at the same time.

You will notice that Dr. Knox has no tourniquet in his First Aid package. Dr. Milligan, of Pittsburg, has. Dr. Wainwright has not. There is another problem. Shall we put into the hands of the laity a tourniquet? The majority says not. Let's work it out.

Another important suggestion of Dr. Knox is the diagnostic tag. Dr. Scott, in his package twenty-three years ago, did not have a diagnostic tag. Here is the diagnostic tag of the Army. It is tied upon the individual and a carbon copy is made. Let's look at it for a moment. Date, hour and station when tagged, name, rank, etc., are given. But the date and hour of the injury are not on here. You can only tell when he was tagged, which may have been two weeks after the injury. We need the date and hour of the injury and also of the first treatment. That must be on every tag. For instance, if it says "Bullet wound of the abdomen," we want to know the HOUR he was shot and the date and hour of the first treatment.

Now, if that tag is good for the Army, it is good for the railroads. It is the same principle.

Why not have a uniform tag throughout the United States?

Again, is this the best tag we can devise? The French started with this tag, and now what have they? They have the American railroad check, for it will stand wear and tear. They have different colors. You can tell when a soldier was entered into the hospital from the color of his tag and from the time he was hurt to the time you see him. So it is possible to get up a uniform method of tagging. Here we have a record by which we can find out if First Aid is any good. Suppose it would cost $50,000, if not a great deal more, to put First Aid throughout the United States? We have absolutely no evidence today, gentlemen, that First Aid is essential. Cushing and Crile say First Aid is no good. That is one of the faults of the minority who write, and of the majority who work. That is their statement. They have absolutely no evidence to prove it. That is a very broad statement, but they do not have the evidence to prove it. Nor have we positive evidence that First Aid is essential.

Of course the best thing to do would be to have the best surgeon right there when the man is hurt, but you can not do that. The first thing to do is to get an injured man to the best available surgeon and to the best hospital as soon as you can. But you can not do it. Now, is there something that will fill in the gap between the time of the injury and this transportation? Can First Aid meet it? Can we instruct enough people along the railroads and in mines and manufactories; and can we adopt some simple method? That is the problem.

There is to be a Board of Standardization appointed in Washington by the President; a member from the Army, the Navy, your chief surgeons, and a member of the American and Southern Medical Associations, etc. But, gentlemen, they have to have some data. All they can do is to be a court to sift and judge the facts. Now, whence are the facts coming? They are not in the literature. The railroad surgeon, and the surgeon who has the experience with accidents, has the facts. We have to start First Aid on the railroad along the most economical and simplest ways. The simplest methods and the simplest instructions must be employed, and we must study the results, adding or subtracting as we go along. And that is why I have come down here in contact with the railroad surgeon to study the accidents, because you really are the experimenters. Of course, if we could get a serum like antitoxin that would prevent all infections, all we would have left to look after would be hemorrhage and mobilization. But we haven't it.

Later on in the discussion, if you are interested, I have some of the various packages of the Red Cross and the Army which I would be glad to show you.

This is the new Army belt that, perhaps, after the discussion, you would like to see.

There is one very important thing worth mentioning in regard to the relation of a bandage to adhesive straps. When I wrote the manufacturers and asked them how long adhesive straps would keep, they could not tell me. I wrote to twenty-five surgeons, and Milligan was the only one who could give me any answer. He had put some adhesive straps away ten years ago and they were good today. I was the second one. I had fished seven years ago in the Rocky Mountains, and, as the first day I fished I generally hooked my ear or some other part of my body, I generally carried a little gauze, alcohol and adhesive plaster. The adhesive, without any covering, was just as good as the day I put it away. Therefore, it is perfectly possible to use adhesive straps to fix smaller wounds.

This is a very disjointed summary I am well aware; but the point I wish to impress upon you is that every surgeon who has any experience in accident work is just as responsible as any one else, and we must adopt something, try it, and we must study the records of our experience. Your chief surgeon can not do anything without your co-operation. You have to be interested in it, too. You have to feel that this is today the great propaganda. And here is the opportunity for the Association of Railroad Surgeons of the Southern Medical Association to start the propaganda—not the propaganda of talk, which is already started, but the propaganda of **doing**, which is not yet started.

Dr. Albert Pinkney Terrill, Dallas, Tex.—I have just returned from the front, and, as Dr. Bloodgood says, I have found First Aid over there a failure. Why, I do not know. We had one thousand beds just back of the firing line, accommodating about seven hundred patients all the time. We did not have one case that was not infected. We were in the first series of hospitals to get a patient after he was given First Aid and sent back of the line. Every case was pus. I did not see a case, no matter what part of the body was injured, that was not infected in some way.

As to some of the points Dr. Bloodgood brought out in regard to the diagnostic tag, it seems to me it would be a good thing, in addition to having the time and place of the dressing, to know whether or not the patient has had antitetanic serum. We would get patients and would ask them, "Have you had serum?" They would only know that they had had some kind of injection. Thus valuable time would be lost, and some patients we would lose on that account. Sometimes they would say they had had serum when they had not had it at all. The only thing they were certain to know was that they wanted a cigarette. They would ask for one the first thing—and would get it.

Sir Almroth Wright told me he was working on a serum that would kill the streptococcus and the staphylococcus.

We had absolutely specific instructions that the only thing we could use on wounds was normal salt solution containing potash, the theory being that it produced a lymph flow that kept the pus washed out and prevented the migration of the germs into the tissues themselves.

Dr. Charles E. Cantrell, Greenville, Tex.—I would like to speak of some of the difficulties we have if those opposed to First Aid by employees are allowed to teach those in favor of First Aid. Those difficulties account for a great many of the differences of opinion as to First Aid.

Most of these railroad injuries must finally be settled in court, where the question of "who gave the First Aid," and the qualifications, and making the company responsible for the acts of those

who administer First Aid, makes quite a difference between railway surgery and army surgery. The Army may teach its men what it will, without any fear of consequences; the railroads can not do that, gentlemen. If they do, they pay very dearly for it.

Many times it costs much less money to settle for a man dead than alive. Many times it costs very much less to settle for a man with a limb off than for a man with a long-drawn-out course of treatment. This has not modified in the least the action of men who can be really responsible. Dr. Knox, Dr. Scott and other chief surgeons, as well as men with smaller responsibilities, have been saving limbs at the expense of the company, and saving lives that are a much greater expense to the company. Consequently, they can not place the lives in the hands of incompetents who will be known as incompetents in the courts. These two men are nearly the only two who have come out of the experience we had twenty years ago in furnishing First Aid and are still putting supplies into the hands of those who constricted the blood supply so that limbs were lost on that account.

Gentlemen, it is a thing that you can not sum up and hope to get the truth about as exactly from railroads as you could from the Army, where men may do as they please.

I am glad that this question is to be discussed, that it is to be thought out, that we are to have something really from headquarters that the people will accept, and something that we may accept and be guided by for court procedure.

I believe Crile is right when he discards First Aid in the hands of the laity. From the standpoint of reckoning in the courts I know he is correct, because a doctor with no reputation at all, if he has the sanction of this State to practice medicine, will make a much better showing in court than an engineer or conductor who may act very intelligently along this line.

Dr. William Launcelot Brown, El Paso, Tex.—I think First Aid is a subject that we should take up and standardize. You can not apply Red Cross and Army methods to railroads, but not for the reasons that Dr. Cantrell just stated. I think we can do as we please with our railroad patients, and if we do not we should not have anything to do with them. But we have heard much of Red Cross teaching, and we must know that many of these methods do not apply. They are too complicated. As Dr. Scott said, and others have emphasized the same point, it is not so important what we try to teach the employees to do as it is what we try to teach them not to do. And that is the reason we have no antiseptic in our First Aid, because it is an invitation to wash the wounds, and we do not want that done.

We have had three cases within a year where, if the man had waited to go to the First Aid package for the constrictor, the patient would have been dead. We do believe in teaching the men to put on simple constrictors in emergency, because the emergency that requires a constrictor at all does not give you time to go to your First Aid package.

Adhesive plaster has no place, we believe, in railway emergency packages. You can not, with all your teaching, keep the employees from sticking adhesive plaster to open wounds. They will do it if it is there in spite of everything.

Stretchers and splints that are taught to be used by the Red Cross are not applicable to railway work except to a limited extent. Dr. Scott hit the nail upon the head when he said: "We have got to segregate our railway First Aid work." The shop work is different. First Aid schemes are impossible in the operating service of the railroad. The First Aid crew is not on the same train at all, because they are always changing, so we can not have the team work. And it remains to try to teach the employees what not to do. Have a very simple First Aid package. Teach them not to wash the wounds. It is not what they put into the wound, but what they keep out of it that allows it to heal.

There are one or two small criticisms that we would make of the G. H.'s aid package: We have had our worst experience with First Aid packages because we could make no one responsible for them. We tried the same way that the G. H. tried with theirs. But when the accident happens their package will be empty. So we use a seal in the first place, having the package in a metallic box whose lid closes at least one inch over its edge to make it as nearly as possible dust-proof. And that box is always sealed with an official railroad seal just as is a box car. Those seals are given out to the storekeepers and charged to them just as to the boy who seals the box car. If those packages are ever opened, it necessitates a report upon the injury and all the details by the employee himself.

That gives us a check upon the minor injuries, and it keeps the employees from taking the supplies out of the boxes and carrying them away with them. The box will always be full, because for instance if it is found by a traveling freight inspector that a box is in a caboose without a seal the conductor is liable to discipline. Therefore the difficulties are sufficiently great so that they do not open it for trivial matters and abuse the privilege in that way.

On the other hand, I feel that the movement that Dr. Bloodgood has started is a very important one. So far as the railway surgeons are concerned, we can give the results of our cases. We can generally give you a report within thirty minutes—the character of the injury, where it occurred, etc. When the patient reaches the local surgeon the latter makes a report and the same is also done at the division hospital. And so the Army tag, as in time of war, would be wholly unnecessary. Dr. Knox knows the time and all those details within an hour if it is within his radius, because a written report has to be made to the superintendent by the local and the division surgeons giving all the details, the medicine, etc.

Dr. Jere L. Crook, Jackson, Tenn.—I believe that this movement has wonderful possibilities for good in a great many respects.

Dr. Bloodgood has told us that literature in railroad surgery is conspicuous by its absence. That is probably true as regards text-books, but it is rather voluminous from the railway journal standpoint, because several journals publish nothing but railroad surgical work; and now probably

every large railroad system has its own association which publishes its proceedings. Then we have the National Association, and last, but not least, the one we are attending today.

As I take it from the discussion, what we want is standardization of the First Aid package. We do not want to be giving iodoform to employees of the railroad company to spread on **ad libitum**; we do not want to give them vaseline to spread over a fresh cut; we want to get that package down in as simple terms as possible. It is to teach the employee **not to do** things that will have the bearing upon the after results in the patient's case. There have been cases on record, as we all know, where men have been allowed to bleed to death because no one had the nerve, or the sense, to put a little compress over an artery. And that is the important thing to teach them—to put on a little tourniquet of a handkerchief if you have a large artery spurting. And when we get sterile gauze properly sealed up, two or three bandages, that is about all of the First Aid that the package should contain.

First Aid meetings should be held by a railroad company at the headquarters; attendance should be compulsory; and the chief surgeon and his co-workers should give the employees the necessary instructions about what to do and what not to do.

The report from headquarters by Dr. Terrill shows that the First Aid package in war is a failure. I take it that the First Aid treatment there was by the first doctor who saw the patient.

We have had a paper by Dr. Leigh on compound fractures and what we should do in those cases. What the doctor should do is just as important as what the employee should do, and that brings up the question of the antiseptic. It is generally understood that iodine and alcohol is the thing to pour into a comminuted septic wound. We do not wish to mix it with water, and I do not think the wound should be treated with bichlorid of mercury solution. You defeat the object of the iodine when you pour in the mercury solution.

For the last few weeks I have been very much impressed with the solution by Dr. Ellis McDonald, of New York, which has been proven to be far more efficient than any known antiseptic. In a recent number of "Surgery, Gynecology and Obstetrics" he has proven that he has developed a solution which will absolutely sterilize the hands of the surgeon in two minutes. And you can also cleanse up to the edges of the wound, and it is better than iodine. It is composed of:

Acetone	40%
Denatured Alcohol	60%
Pyxol	2%

I have been using that solution all the time in my work, and when we have to do an emergency operation in a compound fracture (notwithstanding the fact that since Mr. Lane read his paper we have been afraid to invade the wound), we have gone right ahead in certain cases and operated anyway, and we are getting the same good results that we used to get.

In a case of that kind rubber gloves do not come in. The environment is septic and the solution is antiseptic, and you can make your hands practically sterile. Then you can handle the muscles and tendons. Of course we do not handle the bones except with some sterile instrument; and this solution guarantees the surgeon's hands will be sterile. Then we have a fair chance of getting a good result. In bad comminuted fractures it would be folly to put them up with any sort of apparatus without making some effort at repair.

If we can get the limb in any comfortable position, I would wait for eight to ten days, because, by that time the blood has a sufficient army of defense reserves to ward off infection.

Dr. McAlister—I want to ask if Dr. Terrill will state whether his First Aid, as applied at the front, meant aid by a fellow soldier or a doctor?

Dr. Terrill.—A surgeon at the front.

Dr. McAlister.—Dr. Leigh said cleanse the wound out thoroughly with bichlorid. Doesn't it interfere with the healing of the wound?

Dr. J. L. Jelks, Memphis, Tenn.—It occurs to me we have skipped one very important subject—the medico-legal viewpoint. Gentlemen, the railway surgeons, in a great many instances, are not the first doctors to reach these cases. That is a misfortune. How often have you railway surgeons had cases sent you who had compound fractures, say, and with some dirty cotton or gauze stuffed into that wound and the leg then bandaged with plaster-of-Paris? And how difficult it is to save that limb, for gangrene is so often the result!

I should say it would be a good plan to put on your emergency box about three **"Don'ts,"** and put them in italics. First, **"Don't** touch or handle an open wound with your hands;" secondly, **"Don't** put a plaster-of-Paris bandage upon any wound of the extremities, or if you do, **don't** fail to put in a window;" and thirdly, **"Don't** pack a surgical wound of the extremity where the bone is involved with anything that you know has touched anything else, even though that be your hands, for thereby you carry in, instead of keeping out, infection."

Finally, the constrictor. I have known that to cost the railroad the price of a limb. And how often it would be so much easier to control hemorrhage by elevation rather than constriction.

Dr. Thos. D. Frizzell, Quanah, Tex.—For a number of years I have been handling corporation work. I have seen the constrictor cost the corporations money. I have seen the failure to use a constrictor cost the patient his life. Now, I don't think you can set any hard and fast rule. Less than thirty days ago I saw a man lose his life from his limb being cut off by a string of box cars going over it and the man bled to death simply for the reason that they did not control the hemorrhage.

Now, the men that I have charge of do not get in their emergency box a constrictor, but I took this case up and said: "Gentlemen, if this occurs again and you can not get anything else (there was a barbed wire fence near by), cut out a piece of the fence and save the man's life."

A constrictor is a bad thing to turn over to a layman, but in the case of a man with his limb

cut off and it spurting blood sufficient pressure must be made to cut off the blood supply.

Dr. Wade Hampton Walker, Wichita Falls, Tex.—I do not think we should allow the employees to apply the tourniquet. I think it just as dangerous in the hands of the employee as a pistol is in the hands of the average man. I am surprised to learn that you do not generally use antiseptics in these First Aid packages.

As local surgeon for the past sixteen years, I have seen quite a few injuries on the Fort Worth, Denver & Wichita Valley Railroad. We always use one to four thousand bichlorid solution in a wet pack and keep it wet, and instruct the employee or doctor who carries the patient to the hospital to keep this wound wet. Pour the wound full of tincture of iodine diluted one-half with pure alcohol, or preferably, balsam of fir and castor oil. The oil treatment for wounds is good. If you have a gunshot wound of the abdomen you can pour it full of it without any trouble. You have probably a little nephritis following the absorption of the turpentine in the balsam.

I am surprised not to hear any of the doctors mention the use of morphine to prevent shock and pain. I do not think we should let the patient suffer. The first thing to do if a patient is bleeding, is to tell one of the employees to put his finger or hand upon the artery. And I administer morphine. No matter how much you handle a railroad wound in the first few minutes after it is inflicted, it can not absorb any poisons unless it is confined in the wound or dressings. I am surprised they do not use bichlorid solutions or something to cleanse the wounds.

Do not treat a wound or burn by the open method. I think that is foolishness. Where we have appendiceal abscess or any abscesses, we use balsam of fir and castor oil, equal parts, and in two or three days you have no more pus. It does away with the odor immediately.

Again, I want to compliment Dr. Scott upon his conservative manner of using the constrictor, because many times you have to amputate the second time for "pressure necrosis." A month ago I had a ranchman bring in his daughter, who had cut her radial artery. He had tied it up with a bandage and it bled. Then he put sugar, flour, etc., upon it; and finally he used the old Spanish windlass. When the child came in she had an enormously swollen hand and partial paralysis, due to pressure over the ulna nerve. She is gradually getting back to normal. Had he had something else there, and not used so much pressure, she would probably have had no nerve injury at all.

Dr. Thos. H. Hancock, Atlanta, Ga.—In my paper I asked when would doctors cease to disagree. They never will. I wish to emphasize only one point in the First Aid in railway surgery. Since I have been doing railway surgery I have seen several men who had bled to death. They should not have died. It is very hard to tie some of the limbs so that the larger arteries will be controlled, especially where there is nothing but a bell cord to use. But if this is passed around the limb twice and a surgeon's knot used, it will usually suffice. I have recently had a case where I could not control the hemorrhage in this way myself, but when I tried a large piece of rubber tubing I had no trouble whatsoever.

It is better to sacrifice a thousand limbs than to lose one life. The litigation should have nothing to do with the surgeon's duty toward his patients, and he should do everything to preserve life. I would insist upon having a tourniquet or a large piece of rubber tubing in the First Aid package.

The tag on the patient showing what has been given is a good idea. We often have men come in and we do not know whether the condition is one of coma or one of too much morphine. There are those who do not hesitate to give a half a grain hypodermically and then repeat it in a short time. A quarter of a grain should be the maximum dose and it should not be repeated for two hours. If it does not relieve the pain, a general anesthetic should be given.

The hospital car does not seem to me to be practical. The surgeon should be taken to the scene of the derailment on the first available engine and he can always care for the injured 'till they can be moved on cots in a baggage car or sleeper. Most railroad men, however, think the most important thing is to get the track cleared.

Dr. Knox (closing).—The question of First Aid to the injured is such a large subject that I will confine my remarks in closing to "The First Aid Package." In the discussion no one has spoken either approvingly or otherwise of the addition to the package of 2.5% carbolated vaseline. This may not be the best antiseptic, but it has a number of valuable uses. Besides being a dressing for simple wounds, it is very valuable in burns. It is put up in collapsible tubes and can be applied to the affected parts without coming in contact with the operator's hands. Since the almost universal use of oil for fuel, burns are more frequent; and a good dressing of this kind is very necessary in the First Aid package.

Regarding our instructions for the use of First Aid package, I notice there is some confusion. If our instructions were intended for the use of the profession they would differ materially from what we would suggest for laymen. As I understand it, the First Aid package is designed primarily for those who have no medical or surgical knowledge, and it therefore follows that the contents of the package, as well as instructions accompanying it, should be of the simplest possible nature. For this reason strong antiseptics, medicinal agents, or the Esmarch's bandage should not be included.

Besides the great value of the First Aid package in train service, I have found it valuable at stations in sparsely settled districts where no doctors are available; also at shops, and in large section and bridge gangs. By enclosing a small manual of instruction with each package it is surprising how quickly the average foreman learns how to take care of minor injuries. I believe instructions in the form of literature of this kind more practical and efficient than lectures.

The most important consideration in this connection, besides the contents of the First Aid package, is the proper method of handling and making reports. Without method in handling and the fixing of responsibility, anything connected with railroad operations is a failure, and First Aid

work is no exception to this rule. The men will take a greater interest in the work if the railroads recognize its importance and give it greater attention. A few simple rules that can be readily understood, not only for the proper handling and use of the package, but for making reports of each case treated, will add to the value of the work and economy of material. With the system I now have in operation for First Aid, this branch of work will receive recognition in our annual hospital reports. I do not approve of Dr. Brown's plan of putting sealed metal tags on the boxes. I think the paste board boxes better and they are much cheaper. You must, of course, expect some loss, but this can not be helped. If you put too many safeguards around the operation of your box it might not be used so often as it should be. It now costs only 80 cents and when Dr. Bloodgood's standardization gets in working order we expect to reduce this price very materially.

Dr. Leigh (closing).—The question has been asked about iodine and bichlorid. Our idea is that if the skin is wet it should be wiped off with alcohol, then painted with iodine and allowed to dry, which takes only a very few minutes, then use bichlorid in the wound. Our experience shows—to our satisfaction at least—that it does not interfere with primary healing.

About using iodine in the wound: That is a question that has not been settled by the profession. We know that full strength tincture of iodine will seriously interfere with wound healing. What strength will be strong enough to disinfect and not strong enough to injure is an open question.

I enjoyed very much hearing Dr. Terrill's report from the front. I was much disappointed to learn that in the hospital with which he was connected they were not using antiseptics. My own information, gathered from other visitors and workers at the front, was to the effect that in the early part of the war asepsis was shown to be so completely a failure that antisepsis was now being freely used.

My idea about the First Aid work is that the employees should be taught how to dress a wound in the simplest possible manner; should be supplied with large pieces of sterile gauze and cotton; should be taught how to apply that gauze without touching the side next the wound; put on cotton to pad the wound; apply a bandage and splints; and also be taught how to use a Spanish windlass, and that is all. And taught to do nothing else, as Dr. Brown very wisely said in his discussion.

I think we have neglected the discussion as to the doctor's First Aid a little too much. I think there is a better field for improvement and work in connection with the First Aid given by the physician rather than the First Aid given by the employees.

Dr. A. C. Scott, Temple, Tex. (closing).—I know you are getting tired and I shall not detain you very long.

This subject is one of such magnitude that it is impossible to cover a very large number of points in which we are interested.

I am impressed with the fact that there are three great things which should be considered of paramount importance in rendering First Aid attention. On our line of railroad we have endeavored to standardize our First Aid to a certain extent.

I very much appreciate the efforts which Dr. Bloodgood is putting forth, because it has already had the effect of renewing some of my energy along these lines. I grant you that I became so discouraged many years ago about the effectiveness of some of our First Aid efforts that I got rather lukewarm over the matter. Perhaps my attitude was brought about in a measure by my deeper interest being along other lines. My work is not limited to railroad work, and I sometimes get much more deeply interested in other affairs. But in the consideration of railroad First Aid work we have endeavored to arrive at simplicity. Now, gentlemen, when we consider the fact that at one end of the line we have a patient with an ignorant and untrained person, as a rule, near him, and at the other end of the line we have a well equipped hospital with a well trained surgeon or a group of surgeons well prepared to handle wounds in a first-class manner when the patient arrives there, and when we consider the fact that between that patient and this institution are to be had other men of varying degrees of intelligence and training, including the local surgeon, we must remember that in order to get the best results in the early stages of that patient's treatment, we must arrive at the simplest method possible.

To insure that our men shall have the services of a physician within an hour after the injury, we have appointed local surgeons at almost all little stations, and have endeavored to inform ourselves as to the most competent and reliable physicians, and have endeavored to get them wherever possible. We have surgeons scattered over something like two thousand miles of our land, anywhere from ten to fifteen miles apart. We consider our First Aid attention that which is rendered by the employee who is on the ground and by the local surgeon.

We have at repeated intervals endeavored to inform our local surgeons as to the limits of the treatment which we would expect of them, but we have in all cases striven for simplicity, both with the men's instruction and with the local surgeon's. We have attempted to impress upon the surgeons in those places where they are not absolutely prepared to make a wound sterile through lack of proper facilities—it is rather difficult to make any wounds sterile—that if they are not prepared to give the best attention known to aseptic surgery, then the next thing is to take care of the hemorrhage without running the risk of damaging uninjured tissue; and next that they shall take care of pain, realizing that it contributes largely to shock. Now, no effort is ever made to attend to that kind of service among men who are not doctors, but the doctors themselves are expected to give morphine as indicated in each case.

Doctors and employees alike are instructed never to give whiskey. You will notice in my paper that I stated that we expected to revise our rules somewhat. It is just very recently that I discovered that some one, without my knowledge or consent, had slipped in a little proviso that in case they would give a little whiskey to give only three or four drams, well diluted in

water! In my opinion that should have no place in First Aid work at all. Whenever a railroad employee has any liberty to give a small amount of liquor, he gives it to the patient as he would want to take it himself if he were hurt, and he generally empties a pint bottle.

Then, the matter of infection. Hemorrhage, pain and infection we must give attention to in our First Aid work.

Matters of convenience and transportation and attention to a great many minor details that are to be looked after at various times should receive a secondary place, and in attempting to standardize this First Aid work we must come down to this sort of simplicity. Dr. Knox has said if we could agree on certain things then we could be more successful. If we are going to agree on anything we will have to do something analogous to that of some of the orthodox Christian denominations. They are doing away with many of their interpretations of the Bible and are coming down to this one thing: "Do you believe in Jesus Christ?"

In regard to hemorrhage, I expressed my ideas on that line in my paper.

Time after time men who have had limbs crushed off by the wheels of a railroad car have lain in the presence of half a dozen people with a big artery just spurting up like a fire hose and not one of them knew that by exerting just the slightest pressure with an index finger they could stop that blood until a physician could be procured. Whenever they are taught that they have to get hold of a limb and twist and twist with a windlass, they are often going to let the patient bleed to death before they can get that twisted tight enough.

I have endeavored to teach our men whenever they see a freely bleeding wound to put pressure upon the spot. If it is a big, crushed wound, grab it with both hands and swing on to it until some one can come to their assistance. Then put on a compress and make their constriction as close to that bleeding point as possible.

I have been endeavoring to impress upon railroad men the fact that slight pressure will do wonderful things when placed upon a bleeding point, with this illustration: If you take a garden hose that is leaking and you endeavor to get behind that leak and squeeze between the leak and the hydrant, you must first overcome the normal resistance of the hose itself, which reqires great pressure, and secondly the resistance of the entire volume of water, whereas, with the slightest pressure over the leak in that hose it is all stopped.

As to infection, we want to remember in railway surgery that wounds are very frequently infected, just as gunshot wounds are, from the very second they are made; that there are bacteria which will grow in those wounds very rapidly; that the most serious form of bacteria growing in the wounds are bacteria which do not grow well when exposed to air, as has been recently shown by Wright, of London; and that the more open the wounds are and the more freely they are exposed to the air when infected, the less danger there is of that infection's being multiplied and carried up among the nerves, fascia, etc., to more remote points.

There are many wounds which may be cleansed well, but I wish to establish drainage, and I am just old-fashioned enough to feel that I can get the best drainage from gauze, notwithstanding the fact that Dr. Bloodgood and others have shown that gauze plugs up in the first twenty-four hours. But the first twelve hours after a wound is infected is of far greater importance than the next day or the second day afterward. And if I can get the greatest amount of exposure of that wound, and the least absorption from it, during the first twelve hours, then I am willing to put the patient to the trouble of having the gauze renewed if necessary.

Where there is considerable mangling but no destruction and where lacerations have taken place between muscular sheaths, if dirt and other filth has been introduced and they are not sufficient to require amputation, then the more we separate the edges the better.

Dr. J. C. Bloodgood, Baltimore, Md. (closing).—I would be very glad if this afternoon a resolution would be passed authorizing the President or the Executive Committee to appoint a committee of three to represent this Association.

The function of that committee is to help the Secretary of the American First Aid Association in getting the opinions of surgeons. The committee will help the Secretary get the opinion and experience of this Association.

I think we have had a pretty good demonstration of what happened at the American First Aid Conference—that we disagreed. I hope we shall find that we disagree on unimportant things and that we agree on the essentials. If we agree on the essentials we will standardize them and try to forget the non-essentials.

AUTHORS' ABSTRACTS

First Aid.

The Relation of the United States Public Health Service to First Aid. By W. C. Rucker, Washington, D. C. The Military Surgeon, June, 1916, p. 639.

This article is a condensed resume of the history of the work which the Public Health Service has done with regard to first aid. It tells of the inspection of ships' medicine chests, the instruction of merchant masters, mates and pilots in principles of first aid, and the work which has been done on the inland rivers. It is noted that the writer has neglected to mention the Medical Handbook for the Alaska School Service, which was prepared by an officer of the Public Health Service.

EYE, EAR, NOSE AND THROAT

LEUCO-SARCOMA OF THE CHOROID. REPORT OF A CASE.*

By H. Moulton, M.D., F.A.C.S.,
Fort Smith, Ark.

According to Hill Griffith** sarcoma of the choroid occurs in about one out of every three thousand eye cases. According to the same author, not more than one out of every ten or fifteen of these is of the non-pigmented variety. Moreover, not half the cases of any variety are met within the first stage.

The rarity of the case, together with the fact that it came under observation in the first stage, are offered in justification of this report.

The patient was first examined by my son, Dr. E. C. Moulton, who has described it as follows:

Mr. B., age 58, farmer, came into the office on March 7, 1915, with the history that two months before he had caught cold. A day or so later he suffered from pain in his left ear and temple, which soon subsided. Very soon after the earache he noticed a spot before the left eye, downward and outward. This gradually increased in size, but has not changed in the last three weeks. Patient is confident that the left eye is only recently affected, because within the year he has used that eye in sighting over a rifle while squirrel shooting. There has never been pain in the eye.

Upon examination it is noticed that both eyes are white and quite without inflammatory signs.

Pupil of right eye 3 M. M.; reacts normally. Left eye 4 M. M.; does not react to direct light, but does react consensually.

Vision—Right eye, 20/24. Field normal. Left eye, 6/200. Field contracted, mostly in the temporal and inferior quadrant.

Tension of both eyes was normal.

The ophthalmoscope showed a normal fundus and media for the right eye. In the fundus of the left eye, above and somewhat to the nasal side, a tumor could be seen, filling about one-fifth of the vitreous chamber, hanging down from the equator, and extending far enough almost to hide the papilla. But little pigment was seen on the surface. A few vessels coursed over it. It was slightly uneven in outline, but not wavy. The edges were sharply outlined. There was no quivering. The retina, however, was edematous in other parts of the fundus.

Transillumination showed a darkened pupil when the light was placed over the tumor. A bright pupil when placed elsewhere. The tumor could be plainly seen with both focal artificial, and diffused daylight.

The diagnosis of a solid tumor, possibly sarcoma, was made. Enucleation was done six days later.

I have here half the eye mounted in glycerin jelly and some sections prepared by Dr. E. C. Moulton, which you can see.

The tumor lies in the upper nasal quadrant and the section is seen to be perfectly devoid of pigment. The ciliary body, the optic nerve and the sclera have not been invaded.

The microscope shows the tumor to be a small spindle celled sarcoma without pigment,—a true leuco-sarcoma.

Some of the cases reported in literature as leuco-sarcoma are described nevertheless as containing a few scattered pigment cells. This seems to have absolutely none. This is the only case I have ever seen.

Among the dozen or more of melanotic sarcomas originating in the choroid, upon which I have operated, are four upon which I operated before they had penetrated the outer coats of the eye ball.

All are living and well, two of them for more than five years, one three years and another only a few months.

The prognosis of leuco-sarcoma is said to be rather more hopeful than that of the melanotic type.

DISCUSSION.

Dr. L. Haynes Buxton, Oklahoma City, Okla.—I am sure this Section is under obligations to Dr. Moulton for presenting in so interesting a way the subject of leuco-sarcoma. It is so rarely that this variety of malignant intra-ocular tumors is reported that we can well afford to take a look at the subject in a general way. Through the courtesy of Dr. Moulton, who furnished me with a copy of his paper, I have made some notes with special reference to the relationship of the pigmented and non-pigmented variety of these tumors.

The true classification of these tumors should be clearly kept in mind. Laennec, in 1819, was the first observer to clearly define intra-ocular sarcoma, and this was in connection with his effort to differentiate between the pigmented and

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*Read in Eye, Ear, Nose and Throat Section, Southern Medical Association, Ninth Annual Meeting, Dallas, Tex., Nov. 8-11, 1915.

**System of Diseases of the Eye, Norris and Oliver, Vol. III, p. 365.

what he supposed to be non-malignant forms. The former he called "melanoses," and the non-pigmented forms he considered malignant. But Virchow in his immortal treatise laid special stress upon the fact that pigmentation was of secondary importance. The real differentiation between malignant and non-malignant intra-ocular tumors lies in their histological structure.

Fuchs in 1882, in his able monograph, "Sarcoma of the Uveal Tract," collected 259 cases, all that he could discover to that date.

Lawford and Collins in 1891 collected 133 cases from the records of the Moorefield Eye Hospital, London.

Herbert Parsons, of London, who founds his observations upon his pathological work at Moorefield, wrote in 1905: "The old division into melanotic and leuco-sarcoma founded upon the presence or absence of pigment is often scientifically inaccurate, or at least ambiguous."

Fuchs describes no less than 14 intra-ocular forms of sarcoma, and many other observers have made many kinds of divisions as to form, cellular structure, location, and pigmentation. But with our absolute ignorance as to the etiology of sarcoma, it seems that some simple classification as melano- and leuco-sarcoma is more advisable.

The only statistics with which I am acquainted as to the relative frequency of these two forms of sarcoma are those presented by Fuchs and Powel, who report a relation of about six or nine pigmented to one non-pigmented,—about 22% non-pigmented; while Kerchsbaumer examined 13 melanotic and 27 non-pigmented, but with hematogenous pigmentation,—a very different result, as you see.

Many observers have concluded that the percentage of leuco-sarcoma grows less with age. While the round cells and spindle cells seem to be found about equally in leuco-sarcoma, the percentage of spindle cells is very largely increased in melanotic. One of the peculiarities noted by Parsons is that when a pigmented sarcoma breaks its bounds the extra-ocular portion becomes non-pigmented, which establishes the fact that pigmentation is not an essential feature in the growth of this class of tumors.

One interesting case was reported in which the intra-ocular tumor was pigmented, the extra-ocular non-pigmented; and associated with the case was an unpigmented spindle cell sarcoma of the liver, and a squamous cell sarcoma of the rib, lung, and mediastinal glands. Of course, these were simply co-incident rather than an extension of one to the other. Yet they might have been due to a common unknown predisposing cause.

But to recapitulate, the evidence at our command leads us to the conclusion that the general habits of the pigmented and non-pigmented tumors are not of material difference. Incidentally we might notice that round cells are frequently classified as to the shape of their nuclei rather than to the form of the protoplasm. The round cell sarcoma appear to be more malignant and more rapid in its development than the spindle cell variety. Although as heretofore mentioned the two are mixed in the same tumor.

Dr. J. H. Buckley, Fort Smith, Ark.—I do not wish to discuss this paper at length, but I wish to emphasize one point,—early diagnosis and early enucleation. The prognosis is reasonably good if an early enucleation is done. It is not always an easy matter to get our patients to consent to an early enucleation.

I remember some four years ago I had a case, not a leuco- but a pigmented sarcoma, nevertheless a sarcoma. I advised the patient that the eye should come out. This man had good vision in every direction except laterally. In one side of the retina he had no vision. The patient said: "I have no pain. I can see well." I replied: "There will come a time, if you live long enough, when you will wish you had had it removed at this time." About a year afterward he had a very painful glaucoma. He consented to operation; and I enucleated that eye three years ago. Up till the present time there has been no recurrence. Whether there will be or not I do not know. The oculist should insist upon early enucleation where so clearly indicated.

Dr. M. Feingold, New Orleans, La.—I should like to emphasize the point brought about by the essayist that one is very apt to find a leuco-sarcoma. But I want to mention a case in illustration to show how careful one has to be in the diagnosis of a condition histologically. The case I am about to report is not one of intra-ocular sarcoma,—sarcoma of the choroid,—but one of epibulbar sarcoma. It concerns a specimen sent to me by a physician from a neighboring town.

The history given is as follows: A woman about sixty-five years of age had a sarcoma which was repeatedly removed. She finally consented to enucleation. On examination of specimen, and cross section of it microscopically, it looked as though we were dealing with a case of leuco-sarcoma. The histological examination of the specimen showed in nearly all sections pure white leuco-sarcoma. But one day I found in one section that the sarcoma, as long as it was on the sclera and on the cornea itself, was practically free from any pigmentation.

Not satisfied with this, I began to make further examination to come to a focus, and the sections further on showed distinctly that there was a focus of epibulbar sarcoma from which the metastasis from the cornea had extended. And I think that originally that case was probably a melanotic sarcoma; and that from this melanotic sarcoma remained some little seedlings on the sclera which extended into the cornea, and from this recurred the leuco-sarcoma, which was characteristic of the whole specimen.

Dr. Holland, ————————.The malignancy of these tumors is an interesting subject. My idea has always been that the malignancy of the tumor depends upon the degree in which it reduces the embryonic tissue. The nearer it seems to this stage, the more malignant the tumor. The small round cell has a small spindle, and the large round cell a large spindle. It was found that melanotic sarcoma and leuco-sarcoma were the most malignant because of their nearness to the embryonic stage.

Dr. Buxton's remarks were quite interesting to me, and in this connection I would like to report a case that I had some years ago,—a tumor of the choroid. On seeing the case, I thought it was undoubtedly a sarcoma. I called one of my confreres, and in consultation he agreed with me that it was a sarcoma. We, however, got a his-

tory of my patient, and we referred him to one of our other men in the City, and after the third intravenous use of Salvarsan, the tumor began very appreciably to diminish in size; and now, at the end of two years, the man is well and the tumor is gone. He is in practically normal condition as far as vision is concerned. In this connection I might say that we should be very careful indeed to be sure of our diagnosis before doing this and sacrificing the eye.

Dr. H. T. Aynesworth, Waco, Tex.—Since Dr. Buxton brought out the question of the pigmented with relation to non-pigmented tumors, I want to make a supplementary report of a case that I have formerly reported in regard to pigmented sarcoma of the ciliary body. This occurred in one of my cases which developed acute iritis. Under these circumstances, of course, I made the mistake, as several of my confreres have done, in diagnosing the case, and treated him for irido-choroiditis with opacities in the vitreous. Later on, he came under the care of Dr. Woodruff, of Chicago, who likewise failed to diagnose the condition. It went on for about a year or so when the growth of this tumor manifested itself in the anterior chamber and the eye was removed. This part I have already reported.

The supplementary part that I want to report is that this patient went along, and although his other eye was in a very bad condition from a previous trauma in childhood, he went on for two and a half years, when he developed melanosis of the skin. At the same time a half dozen pigmented tumors of the skin appeared, and with that he developed an enlarged condition of the liver. When he came back to see us we recognized immediately the gravity of the condition, and so told him. He went ahead and died in about two months after this condition that I have mentioned had developed.

There is one point that I have never been able to understand in regard to the prognosis in sarcoma of the uveal tract. I may have misread the literature on the subject, but it seems to me that I have read that it does not make much difference in the future prognosis as to the time of removal. If there is an ounce of sense in the early diagnosis contention, I should certainly think that the earlier the eye is removed the better chance for the future. I don't think I am mistaken after reading the numerous articles upon the subject that the prognosis is not influenced by the earlier removal of the eye. I wanted to bring out that point, and if some one can explain that to me I should be very much obliged.

Dr. E. H. Cary, Dallas, Tex.—When we were combatting the evils of the optometrists down at Austin, I was fortunate enough to have a specimen of a very small melanotic sarcoma which had started in the ciliary body. It was easy to demonstrate to the Legislators that we could not possibly see this growth without the widest dilation of the pupil. In looking at this specimen they could see that we had to dilate the pupil widely and look around to see it. The optometrists were claiming that they could make a diagnosis and could send to the ophthalmologist any cases that might have trouble with the eyes,—that they understood diagnosis so well that it was not necessary for them to be excluded, and that they should have the right to practice because they could make a differential diagnosis. We let them go way off with the subject, then came back at them and brought out the specimen and demonstrated that it was utterly impossible for anybody to make a diagnosis of a growth in the eye without looking around and seeing it. Although it might be seen in all probability by men who can use the ophthalmoscope, the chances are a man would miss it unless he could dilate the pupil. On the strength of this demonstration we were able to block the legislation they were after.

I simply mention this to bring to the attention of all of you the possibility of using a specimen of this kind when you have it in going before your legislature. I have the particular specimen mentioned in my laboratory and it is a beauty.

One word more; I am glad to know that Dr. Moulton's results have been so excellent in not having recurrences. My own experience so far would suggest that the mortality rate in literature is a little high. I have not had a case to die where the eye ball was removed and I have one case eight or nine years old. In this particular case, Dr. Thayer, who is an excellent pathologist, traced some cells of the tumor into the blood vessels close to the disc. These cells were apparently on their way through into the circulation. This case is very interesting, particularly from the fact that the woman is living.

Dr. H. Moulton (closing).—There is a great deal about sarcomas of the choroid that I did not discuss in the paper. There is much of the subject we all carry around in our brains. This is a good place to bring it out.

There are some queer things about sarcomas. Queer that they should happen. It is inexplicable why one should be pigmented and the other non-pigmented. Dr. Feingold's observation was very interesting on the sarcoma which he mentioned portions of which were pigmented and portions which were not. The same point was brought out in Dr. Buxton's discussion. As to Dr. Buckley's discussion of the treatment, I didn't bring that out in the paper for the reason that the treatment is not the special point under discussion. But what he said was eminently correct,—that the operation should be done early.

Dr. Aynesworth asked the question whether or not the early removal of a sarcoma was really of any advantage in the prognosis. I have read from numerous authors the statement that recurrence seemed to be nearly as frequent in cases that were removed early as in those that were removed after the eye had been perforated. But I have been unable to gather statistics or to find any one who has gathered sufficient statistics on that point to be able to reach a conclusion. In this specimen of leuco-sarcoma that I brought with me, the cross section apparently shows us that the sclera is in no place invaded by the growth. The growth is at some little distance away from the optic nerve, and from all evidence that we have we would not think that the cells had really wandered beyond the eye. If we found the growth had extended to the optic nerve entrance, we would be more uneasy about the involvement of some of the nerve fibres beyond the point where the nerve was severed. It seems

that it would be but reasonable to think that the prognosis in such a case would be more favorable than if operated later.

A final point. The diagnosis can only be suspected before enucleation. Microscopic examination of the growth alone is positive.

LANTERN SLIDE DEMONSTRATION.*

By R. C. Lynch, M.D.
New Orleans, La.

It is my privilege this afternoon to present to you gentlemen a review of the technique of suspension laryngoscopy with some consideration of the possibilities after the larynx has been exposed to view by this means.

It has been my endeavor in all this work to bring the larynx into perfect working view in all cases, and it is this fact that has made it necessary for me to change the original hook spatula of Prof. Gustave Killian into the one I am about to show you, for, though I have worked with this original pattern and Killian's new model, I have not been able to secure the view that I do with my own. While this may be personal preference, my technique differs so considerably from Prof. Killian's, and my instrument has certain advantages and some innovations over his, that it would seem necessary to show you my technique with my own instrument, that you may compare with his the fields of view with the hope that you may adopt this method in dealing with the operative surgery of the larynx. After all, it is this broad field that up to this time has been handled in such an antiquated and unsurgical manner, and it is for this reason that I have endeavored to bring the larynx into such perfect view that we may sit quietly before the vocal cords and do all of the operative surgery necessary in just the same manner and with the same refined technique that the gynecologist uses when he begins his operative surgery of the vagina.

I have laid stress previously upon the very limited motion of the traveling crane in its horizontal direction and refer you to the "Laryngoscope" for July, 1914, wherein is discussed my table top to correct this difficulty. I still use the table top and feel that it is essential to proper suspension.

I have worked with my own modification of the original Killian hook, with his later perfected instrument, and with some of my own, and will show you now what I believe to be the most flexible instrument yet presented, having advantages and some innovations over previous models.

This spatula is made of tool steel and is perfectly rigid under the greatest strain. Other models are of brass and will bend when under heavy pressure. The body of the instrument is quite heavily made so that we may secure a large milled screw with which to open the gag. The small screw used previously could not be adjusted under the weight of the patient. And to insure against sticking, I have had its circumference drilled so that a small handle may be used as one uses the handle of an automobile or house jack. With such leverage at hand, there need be no fear in this direction. The thread is pitched fairly low to give power, but is still quite rapid in order that during the process of introduction, when the spatula is on the tongue, no time may be lost in securing a firm grip. The mouth will open to a full 1¾ inches, which is somewhat in excess of what is ordinarily needed, and yet provides for the unusually large mouth found in some of the Negro patients. In order that the center of gravity may be kept in the mid-line, and to facilitate the attachment of the adjustable tooth plates, I have utilized a pear-shaped ring; this is attached to the milled screw and forms then a well-balanced mouth gag. In order that the tooth plate of the mouth gag may move freely in the plane of the tongue spatula, I have this screw lever attached; by its movement the tongue spatula may be driven into the mouth for a distance of at least 1½ inches, thus making the spatula adjustable to this extent and allowing to bring the parts as near the surface as possible. At the same time there is developed here a slight tilting motion to the tip of the spatula which will still further lift the epiglottis and assist in securing a proper view of the part. The base of the pear-shaped ring is square and fitted with a slide and pass for the pur-

*Read in Eye, Ear, Nose and Throat Section, Southern Medical Association, Ninth Annual Meeting, Dallas, Tex., Nov. 8-11, 1915.

pose of adjusting the tooth plates. I believe the use of multiple tooth plates giving two points of fixation against the upper jaw to be of greatest value in maintaining the instrument in the proper position and facilitating a proper view. They can be adjusted so as to press upon one or more teeth and the point of their pressure can be carefully selected beforehand to give the best point of vantage. Two are made rather small in size and set at a slight angle to fit the mouths of children and the V-shaped arches of adults; two are swiveled that they may be adapted to all the varying sizes and shapes with which one meets.

The base to which the tongue spatula fits is especially reinforced and heavy and will not give now under the strain of the heaviest extension possible. I have added an additional hook to the shank, which will permit of more motion in the vertical of the traveling crane and which can be used when the head lies on the table as is practiced occasionally on some of the baby cases.

I have tried numerous patterns of tongue spatulas and have now used this one as the best of all. They are made in five sizes and are of tool steel tempered so as not to bend. But if excessive pressure is brought they will bend before breaking. This is for safety. They are slightly concave, are black, roughened on the surface in contact with the tongue, and have fixed flanges attached at a slight angle that will keep the tongue from slipping from side to side and will prevent its infolding around the margins, thus obstructing the view. Lastly the tip of the spatula to come in contact with the epiglottis is slightly heart-shaped and bends up at an obtuse angle, after the principle displayed in Yankaner's post-nasal speculum. It will bring into view the last eighth of an inch of the vocal cords to the commissure, ordinarily the hardest point to see.

I regard complete muscular relaxation as essential to success. The anesthetic which will yield this state best will give the nicest results. I have used both local and general with success, but prefer a general anesthetic for all operative cases in both children and adults, providing no contra indication exists. I have employed the warm ether vapor as is delivered through a Cain-McDermott warm ether apparatus. I have never had any reason up to this time to change to this type. The ether is delivered to the mouth through a mouthpiece which fits in the corner of the mouth and which, while out of the way, is under the control of the operator at all times, a precaution for safety at least. I have worked very satisfactorily under local anesthetics for long periods of time, but the cases were suited both temperamentally and physically for this anesthetic. In babies and young children, for examination only, no anesthetic is required, and in adults when a view is desired it is not even necessary to use the crane, the hook spatula being used as one uses the Jackson, Ingals or Mosher spatula for the same purpose, having, however, the advantage of a much larger field of view and easier to maintain in a definite position.

Having the table top with crane attached, arranged so that the base of the crane will be about four inches in advance of the shoulders, a suction apparatus at hand to care for the secretions, and a patient quiet and relaxed by proper anesthetic, we proceed as follows:

The instrument is closed, and the tooth plates adjusted to the proper points relative to subject's mouth. Selecting the strong teeth, or if none, that part of the alveolus opposite the first bicuspid teeth, the patient lies on the table, head hanging free over the hinged portion and held in a position of semi-extension by an assistant, who is very careful to keep the chin in the middle line. (Fig. 1.)

I now fold a piece of gauze or dental napkin over the teeth of the lower jaw so as to prevent the tongue from coming forward and being caught between the teeth and the spatula. The mouth is opened, the spatula introduced in the midline, its tip following along the postpharyngeal wall (Fig. 2) and its tip will be shown in Fig. 3. The spatula travels always in the mid-line along the postpharyngeal wall until the tooth plates are engaged behind the teeth of the upper jaw; a firm hold is maintained of the patient that neither may lose their relative position and the hook is now adjusted into one of the notches on the traveling crane as in Fig. 4.

Now the tooth plate represents the fixed

point, the tip of the spatula the movable point, and by turning the screw that moves the ring to which is attached the tooth plates, we succeed in driving the tip of the spatula further into the hypo-pharynx that it may gain the laryngeal face of the epiglottis. This movement I have named "jacking," as is shown in Fig. 5. The relative position of the spatula and its relation to the epiglottis is shown in Fig. 6, and the "jacking" process in Fig. 7.

The worm gear joint on the shaft is straightened, which tends to extend the head and bring the tip of the spatula in closer relation with the epiglottis. One can now see the mouth of the esophagus and usually the posterior half of the larynx (Fig. 8). Now, by moving the crane horizontally, we produce still further extension of the head and lifting of the spatula toward the epiglottis, thus straightening the road to the larynx; and the field of view grows larger with this movement. Usually all but the anterior third of the larynx is in view, as in Fig. 9. The tip of the spatula is shown in Fig. 10, and we are now able to look clearly into the larynx.

By lifting the crane vertically, we still further straighten the road, and use the horizontal and vertical movements alternately to secure the desired view of the anterior commissure, as in Fig. 11. A sagital section shows the position of the instrument in Fig. 12, and the fully suspended head is shown in Fig.13. If you pardon me, in Lynch's position as a contradistinction to that of Killian in Fig.14—and by comparison I call your attention to the straight line or even hyper-extension secured by my method as against the curve of Killian. This latter does not show the anterior commissure at all.

I have photographed the view of the larynx as is shown in Fig. 13; and you can readily see that once this position is secured the operative surgery of the larynx as described to you last year will be both perfectly possible and easy to accomplish. And if you follow the steps closely you will acquire just this view in most of the adult cases and in all of the children. Where the epiglottis is very thin and flexible and is not held tight by the spatula, I sometimes find it necessary to place a suture on either side of the mid-line and drive it straight while the spatula is being introduced. This procedure has helped me a number of times. (Shown in Fig. 15.)

In Fig. 17, I am examining a child with the spatula alone; head lying on the table, the spatula being used as a lever to acquire a view of the larynx. One can see well to introduce bronchoscopes, esophagoscopes or intubate in this position easily. It will give a most satisfactory view of the parts for diagnostic purposes. Try it.

Once your patient then is properly suspended, you are then perfectly free with both hands to do the most accurate work the larynx has known. Now, instead of pulling or pinching or biting at the tumor mass you pick it up accurately and dissect it free with a knife. You are free to cauterize accurately and carefully. It is your privilege to work in the larynx as the general surgeon works upon the skin or the gynecologist works in the vagina, and the gagging or other motion of your patient is practically impossible, for his larynx is immovably fixed.

I have removed now by dissection, and one must lay stress upon this point, sixteen cases of papilloma of the larynx in children and adults with a recurrence in but one. This in a child who was free from any recurrence for more than a year and who developed whooping cough, after which hoarseness appeared again and the papilloma returned.

A second dissection was done over three months ago, since when there has been no recurrence. Four cases of intrinsic epithelioma of the larynx have been completely removed. A recurrence took place in one who has since submitted to a laryngectomy and is now well and happy. One other was thought to have a recurrence, but on removal of a small mass proved to be microscopically simple scar tissue, and he is still well, even after three years. The two remaining are free of recurrence with no evidence of any discomfort except a changed voice.

I have destroyed apparently two large epitheliomata of the hypo-pharynx growing at the mouth of the esophagus by the Percy method of cauterization, a procedure impossible by any other means. I have removed the epiglottis for tuberculosis by this means and have cauterized large areas of tuberculous ulcers under suspension

with such ease and accuracy that the dread of former methods no longer hangs over me. I have intubated by this means, have sutured both intra-laryngeally and on the post-laryngeal wall, and in one instance actually produced and sutured in place a plastic flap—a type of surgery previously impossible. One can do every type of work that has been done formerly and can do so much more than has ever been dreamed of by suspension, that it is now time for us to enter upon a new domain of laryngeal surgery and adjust our old thoughts to the more modern methods. If I can help you in this, I am satisfied.

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HARELIP AND CLEFT PALATE.*

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Nothing is more interesting to the medical mind than speculation on the cause of a congenital defect, and especially when this defect is found in as exposed a position as the face. Whether the surface only is effected or the deeper parts as well, or whether the degree of deformity is of a lesser or greater extent, it is all the same, for the features are marred and we first ask, "Why?"

However, that is of only passing moment, for our next thought is of a much more practical turn; what is best to do; when should it be done, and why; which latter question, answered fully, will also include, how.

We take a little more interest also in the deeper portion today, for we have awakened within the last few years to a fuller realization of the fact that the oral cavity is connected with the remainder of the body for other reasons than as a funnel through which to pour food.

Many theories have been advanced and many theories written upon the causation of this and other congenital malformations. But all fail to be proven on account of too little illumination, due to our present state of knowledge. And we can foresee the possibility of very little advance along this line in the immediate future.

Some sections of a fetus about four and one-half months of age found with a harelip may be of interest.

CLASSIFICATION OF DEFORMITIES.

All degrees of cleft of the lip may be seen from a small notch on the edge of the lip upon one or both sides, or a red line extending from the edge of the lip to the anterior naris on one or both sides, to a complete cleft of the lip into the anterior naris, with or without protrusion of the premaxillary bone.

Clefts of the palate occur so slight that there appears to be only a notch in the uvula, or a small groove of the alveolar process upon one side in the region of the lateral incisor, to those so great that the opening is complete from the vestibule of the mouth to the pharynx, either upon one or both sides of the premaxilla. The very great majority of these cases have the same amount of tissue as a normal child, a fact noted by Brophy and Cryer many years ago. But once in a great while we have besides failure to unite also a failure of development.

Why call attention to the degree of deformity? You have frequently heard that these children succumb early in life to the intercurrent diseases, many dying only a few days after birth. Men of large experience in this line can cite large numbers, and these are not to be considered in making up figures of operative mortality. It will be found on looking over these figures that the mortality is in direct ratio to the size of the cleft in unoperated cases, and those who live will be found with the lesser degrees of cleft. Why?

Our pediatrists will tell us that a normal child will not regurgitate food of good quality unless the stomach is filled to distension.

1. These children may be without food sometimes for days because the mother or attending physician does not realize that it can not nurse. Or if they do, are unable to overcome the difficulty and the patient gets a late start.

2. If fed early, the food given with the patient on its back and possibly at a rapid rate with much air, is very frequently regurgitated into the nose, when, if swal-

*Read in Eye, Ear, Nose and Throat Section, Southern Medical Association, Ninth Annual Meeting, Dallas, Tex., Nov. 8-11, 1915.

lowed again, it carries more air and infection, which means more air and gas in the stomach. This happens in this way if there is no harelip. If, however, the lip is open, there is a great deal of loss of food. My experience proves to me that these cases regurgitate less after the palate is closed in front; still less after the lip is closed, as in doing these operations we bring these children nearer to the normal. It seems, therefore, that all the reasons for early operation can be ignored save this one, as they will be fulfilled at the same time.

Two cases recently under my care illustrate this point very nicely. The cases were identical as to the extent of the cleft, the family history, etc., with the exception that "A" was the first child while "B" was second in family, the first being three years of age when "B" was born. Both presented double harelip and cleft palate with protruding premaxillary bone.

Child "A" seen by the writer when about six days old and was in good condition. Mother's milk failed on account of irregular use of breast pump, and after a few days it became necessary to use modified milk. Child did not do well enough to justify operation and finally died when 32 days old.

Child "B" seen when 25 days old. Had been on condensed milk one week on account of lack of mother's milk. Operated by forcing maxilla together and premaxilla back when 26 days old, operation taking 30 minutes. Condensed milk and modified milk continued for four days, when milk was obtained from wet nurse, with cessation of loss and gradual increase in weight.

Apparently if child "A" had been operated upon, even though the conditions seemed unfavorable, the same result would have obtained.

OPERATIVE METHODS.

As before stated, operation should be performed in such a way that the parts will perform, if possible, their normal function, which is the objective in all operative work, whether done early or late in life.

The author believes that the reason for most failures in this class of work in the hands of most general surgeons is the same as given failures in another line of endeavor, and is noted by Smith in a late paper on perfected technic. We do not try the same operation twice, but after a failure with a Lane operation we try a Brophy and after a Brophy, something else, or attempt a modification of either of the aforementioned.

My personal preference is the Brophy operation, with some slight modifications which appeal to me.

It is highly specialized work and can not be well performed by a man who does two or three or half a dozen a year any more than any other technical work. It belongs in the realm of the worker in nose and throat, as he knows most about the relations and physiological action of the parts.

ORDER OF OPERATIONS.

If complete cleft from lip to pharynx, the order would be as follows:

Hard palate, by forcing superior maxilla together and premaxilla into normal position before end of third month.

Lip—Second to sixth month.

Soft palate, sixth to fifteenth month.

If performed within these limits the technic will vary very little, but the outside will to a considerable extent.

The maxilla can be forced together by means of silver sutures which pass from buccal surface through lower part of nasal cavity, coming out on opposite buccal surface. On these silver wires we now thread lead plates of a size to conform to the buccal surface of the alveolus.

Brophy's method is to have both ends open. But we find we can save time by placing a lead plate on closed loop and drawing the double wire through so that it is only necessary to twist the wires upon one side.

By this method the parts are forced into normal positions so that in the median line there is approximation of the edges of the hard palate. The lip is brought into better position as a single cleft. If the premaxilla is protruding, it is easily set back into normal position by removing a wedge-shaped piece, base downward, from the vomer. This must, to obtain the best results, be done submucously and the premaxilla then wired back in place and the mucous membrane and periosteum of the premaxilla sutured to that of the superior maxillary proper. This latter is not always necessary, as simple freshening of the edges of both parts will usually cause union to take place. However, the former is preferable.

After the hard palate is complete we

next turn our attention to the lip operation, which should be performed as soon as the little patient has recovered sufficiently from the first operation, which will be noted by gain in weight. While we have no hard and fast rule, we usually wait, everything else being normal, until the weight is back to the point at the first operation, or one or two pounds over. The reason for not waiting longer, as noted before, is that the child will retain food better, and, as a rule, will gain very rapidly if the lip operation is successful.

The type of lip operation makes very little difference if we obtain an over correction sufficient to allow for contraction of scar tissue.

The author has used, with good results, an operation devised by Owen Smith (see figure). The difficulty of getting a good nostril will usually be overcome if infection of the line of suture is avoided. This is best done by placing a rubber tube in the nostril large enough to make slight tension and extending about one to one and a half inches beyond so that no secretion will soil the wound. Sutures of silkworm and horsehair are used with no dressing and no stay sutures. After all sutures are in place the wound edges are touched with 2% iodine and patient returned to bed. The sutures are removed as follows: One-third at the end of twenty-four hours; one-third at the end of forty-eight hours, and the remainder, seventy-two hours after operation. Whenever the tissue around a suture shows inflammation that suture is removed. It is our belief that much scarring is avoided by early removal of sutures, and we have only had one case where the tissues separated.

The objection to dressings is that they hold secretions next to wound and absorb secretions from the nose, allowing maceration and increasing tissue destruction. Stay or tension sutures strangulate more tissue, and this produces a good field for infection.

After the hard palate and lip have been repaired, it next becomes necessary to repair the soft palate, and the method used is the modified Langenbeck which consists in dissecting the muco-periosteum away from the hard palate and cutting away the nasal muco-periosteum, thus allowing the vault to be lowered and giving sufficient tissue to bridge the gap. It is unnecessary to make lateral incisions in most cases, as tension can be relieved by silver sutures with lead plates, and the resulting scar, produced after healing of the incision, will give a less pliable palate, to say nothing of the liability of sloughing of the flaps on account of the wounding of vessels. There is a great deal more scar tissue produced by the Davies-Coley operation and its modification, Lane's operation; and to my mind they are very objectionable on this account. While in most of these cases we obtain a good anatomical result, we do nof always obtain a good functional result. But the latter will be found in inverse ratio to the age of the child when operated. A child with a palate repaired before it learns to talk will not have the defects of speech found in a child whose palate is repaired after he has learned a faulty speech. However, all of these children need speech training, which can not always be obtained on account of lack of education on the part of the parents so that they may carry it out, or on account of lack of funds to hire a competent teacher for the child. If these difficulties could be overcome we would secure much better results.

DISCUSSION.

Dr. R. C. Lynch, New Orleans, La.—I think Dr. Carmody has made a very poor choice in selecting me to open this discussion. I do not know near enough about it to discuss or criticise anything that he may have to say. In other words, his experience is so much greater than mine that I feel I can not conscientiously compare my own experience with his. Again, it is hard for me to discuss his paper, because I agree with practically every point that he brings out. I have never had the opportunity of operating upon a baby under three months of age for hare lip or cleft palate. I have had the good fortune to see Dr. Brophy do one of these; and it has appealed to my surgical sense that it is the proper thing at the proper time. I mean that it is the proper operation at that time of life. The baby did very nicely, both during and after the operation. Now, there is so little that I can say, and Dr. Carmody has had so much more experience than I, that I believe if he says it's right, it is right. I have that feeling about it. In the correction of hare lip it seems to me that most operators overlook the plastic on the nose. It is to me more essential to correct the nasal opening, and then the lip will be formed afterward. The main view of the plastic then will be the formation—the proper formation—of the nostril rather than the proper formation of the lip. It's much harder, I believe, to perform properly the nasal plastic operation than it is to

close the cleft in the lip so that it would look nice. I hope that point is clear.

The cases I have had to operate upon have been in almost every instance cases where I have had to re-operate upon the lip, due to a faulty method adopted for the closure of the cleft and nostril. It would seem to me that the method had in mind simply the closure of the lip, regardless of the shape of the anterior nasal opening.

One of the greatest advances that I feel has taken place is the leaving off of any dressing on the external wound. These wounds heal much more rapidly, are much cleaner, and much nicer, if they are left naked, as it were, without any attempt at covering at all.

I would ask Dr. Carmody about the rubber tube he uses in the nose. Personally, I have always been rather afraid of rubber around the raw surface. I don't believe that you can keep a rubber tube in the nose and keep it clean. We go back to the time of the Ash operation, where we used the hard rubber splints for maintaining the correction of the septum. In the old Ash operation the secretions that press upon the septum give rise to some necrosis of the tissue. The mere presence of a foreign body in the nose will certainly increase the secretion in that nostril, and that secretion will become infected and there will be a little secretion coming down over the line of union.

In the correction of the defects my experience has been limited to older patients, anywhere from three and one-half to nine and ten years of age. And in those I have used the old-time aid I was originally taught, the Wolfe operation, in which you simply make your incision on either side of the alveolar margin and lift up the flaps—the original operation demanding that packs be introduced in an effort to keep the periosteum from the bone. And I differ there, namely, in simply lifting up the flaps and being sure, absolutely sure, that all the attachments of the palatal muscles to the bone, namely, at the posterior extremity of the roof of the mouth, are thoroughly broken up, so that these muscles will not undertake contraction during this first stage of the operation. Then the bleeding is stopped simply by pressure. Seven days is allowed to elapse between the first operation and the second, the second operation having in mind the suture of the cleft. The reason for the lifting of the flaps at one time and sutures at another stage is that when the flap is lifted up and the periosteum is lifted from the bone, there must occur a certain amount of granulation tissue which will form between the bone and the periosteum, which tissue is simply sufficient to stop the profuse hemorrhage that occurs at that second stage of the operation. And in children the loss of that amount of blood is of tremendous importance to their future welfare, in my opinion. So by simply lifting up these flaps rapidly and making pressure upon them very little blood is lost. The flaps are allowed to granulate at the second stage. A small sub-mucous elevator is run along the line of incision, the flap is lifted up generally with little blood loss and the suturing can then be done. I have a strong preference in suture material for horse hair and have used the little ingenious device of McKenty of New York. It consists simply of little hooks that are attached together after the flaps have been sutured thoroughly. No suture goes through the tissue. In two or three cases—it's a very small number—this has seemed to help. Again, I have always seemed to have a great deal of trouble in maintaining my sutures tight. In other words, in keeping my patients from untying the sutures with their tongues, the tip of the tongue rubbing against the roof of the mouth. So I adopted again the plan of McKenty of having a little frame placed in the roof of the mouth and so arranged that the patient can not rub the tongue against the suture, and the patient can not untie the horse hair quite so readily as with silk or catgut. The patients will untie catgut just as easily as though they had both hands in their mouths, and the same thing is true of silk. Of course your disappointment is extreme when the next morning you look into your patient's mouth and find the sutures untied and nobody untied them—just the tip of the patient's tongue.

Dr. Sellers, ————————: I just want to say a few words. This condition of cleft palate is comparatively a rare condition that we see, and it does not excite enough interest with us to make us familiar with the subject—I mean with the eye, ear, nose and throat men. I don't quite agree with Dr. Carmody, though, in all he says in reference to a man's not doing this work until he becomes proficient. There are cases to come to us who are not well enough prepared to go to Denver or to Dr. Brophy in Chicago, and we can not let these patients go on and on without having something done for them. I feel that a man who has any ingenuity at all, and who understands anatomy of the nasal pharynx and understands the steps made in this operation—I feel that he is doing comparatively well even if he loses a few cases now and then.

I am sorry my experience is so limited, but I can only report three cases, two in babies eight weeks old and one in a baby ten weeks old, in all three of which operations I have had very good success. The baby, the one ten weeks old, was a most deformed creature, the most deformed I have ever seen. It had no nose; it had a complete opening in the ear; it had no lip. The nose was a mass of cartilage turned up this way (indicating). In the two operations, the first operation in bringing the cartilage together, and the next operation in bringing the lip together, we made a very good job out of it. As far as the rubber tube goes, I agree with the doctor on that, in my experience. I think it is a good thing, and at the same time when I use the rubber tube instead of letting the child swallow through the ordinary means I let the child lie on its back or on its stomach. If it's old enough it will do this or you can let it swallow in the ordinary way, but you take an infant six, eigh tor ten weeks old and it has not sense enough to do that, so the better way is to pass the tube through the nose into the stomach.

Dr. J. E. Thompson, Galveston, Tex.—I came here this evening to hear Dr. Carmody; I didn't come here to talk. I came here to learn, because anybody who has had experience with cleft palate cases knows how much there is to learn; that sometimes you feel that you have got it, and then

you get a case that goes all to pieces, and then you have not got it. It has got you.

I have been doing this work now for the last twenty-five years, I suppose, and I have gone through all the phases of this particular operation of cleft palate, and I shall confine myself to the palate in this talk before you now. In the year 1896, until about 1900, I was a great defender and advocate of the Lane operation. I used to perform it in almost every case under circumstances where the clefts were very wide, and I would succeed in rare instances in getting a complete closure in one portion by means of this operation. But I came to the conclusion that the Lane operation could not give me the proper results. Regarding the Brophy method I have always thought, and I still think, that the Brophy is not so simple and not so easy as Brophy would have the average man believe.

AUTHORS' ABSTRACTS.

Surgery, Gynecology, Obstetrics, and Genito-Urinary Diseases.

(Continued from page 726)

Acute and Sub-Acute Metastases. By A. L. Blesh, Oklahoma City, Okla., Southwest Journal of Medicine and Surgery, May, 1916, p. 129.

Modern conception of metastasis is not to be found in the text-books. The work of Rosenow under Frank Billings in showing the transmutability of bacterial strains and their tissue predilections constitutes the great modern medical drive which has placed internal medicine abreast of surgery.

Malignant metastases have long been known. In pyemia also the phenomenon of extension is by "jumping."

Old definitions of metastasis do not now hold. Blood stream dissemination in accordance with special tissue predilection and the law of reduced local resistance from traumatism, etc., is now rising to greater prominence.

Acuteness or chronicity depend more on virulence and quantity of infection in relation to tissue resistance than upon the route of distribution. Secondary lesions are often called "idiopathic." Pathologic changes are true to form, no matter where they occur.

Mouth infections furnish 60% of primary foci. Gall bladder and appendix are frequently infected from the same source.

Active factors of disease metastasis are, of course, always pathogenic bacteria.

Passive are—

1. The nidus or focus.
2. Tissue predilection.
3. Traumatism.
4. Result is the pathology or morbid anatomy.

Factors to be considered are—

1. Infecting agent.
2. Focus or portal of entry.
3. Route metastases.
4. Selective action of germs.

Focus is of utmost importance and here is to be concentrated our diagnostic drive.

Case reports for illustrative purposes.

Above all it must not be forgotten that **surgery is for the benefit of the patient and not the surgeon.**

Again, getting well of an operation does not necessarily mean recovery from a disease.

Chronic Trigonitis. By H. W. E. Walther, New Orleans, La., Medical Record, May 13, 1916, p. 853.

Walther points out that trigonitis **per se** has been a neglected malady among urological workers. Some of the most careful clinicians in this field of medicine have long recognized that there is such a condition as inflammation of the trigone of the urinary bladder, but few even today in this country have taken enough interest in the subject to tabulate their personal opinions or experiences with this form of cystitis.

Garceau, Furniss and Bierhoff have been the most prolific contributors to this subject in American medical literature.

Trigonitis is most common in women. The causes are: (a) primary infection, or (b) secondary infection engrafted upon a simple hyperemia of the trigone due to engorgement of these parts accompanying some pelvic disorder.

The chief symptoms are, frequency of urination, pain during the act, urgency and tenesmus.

The diagnosis can only be made with the cystoscope. The writer fully describes the cystoscopic pictures which characterize this condition.

Under the treatment Walther takes up the dietary treatment, the instituting of free catharsis, rest (physiologic), and medicinal. Of all the urinary antiseptics he believes urotropin of the greatest value. Locally irrigations are mentioned, but not recommended. Instillations of silver nitrate solutions in strengths of from 0.25 to 2% are of extreme value in some cases. The writer uses alypin as a local anesthetic in bladder before instilling the silver. In cases of the worst types which do not respond to the usual line of treatment he recommends suprapubic cystotomy with curettage or otherwise treat trigone through surgical incision and drain viscus with Pezzer catheter.

Canadian 606. By Wm. S. Robertson, Charleston, W. Va., W. Va. Medical Journal, May, 1916, p. 372.

In spite of adverse criticism it is evident from the use of thirty-four injections of Diarsenol that this preparation is identical with Ehrlich's Salvarsan.

Primary, secondary and late syphilis yield as well and as promptly to the Canadian as to the German product. The ill effects following the use of the former have been reported after the administration of the latter and are attributable to idiosyncrasy, faulty technique, administration in unsuitable cases, etc. The author has experienced no difficulties in his series. (Injections to date number 57, June 24th.) The usual dose employed is 0.3 G. This is apparently as effective and is undoubtedly safer. It is repeated in from three to five days as indicated. A simple apparatus is used consisting of a 20 cc. Luer syringe, two-way stop-cock to fit syringe, and two pieces of small rubber tubing about six inches in length. The needle is inserted into the vien, one tube to it and the other in the beaker containing the solution of Diarsenol. By alternate suction and pumping with stop-cock valve properly turned, the beaker is emptied into the circulation.

SPECIAL ARTICLE

THE MEDICAL TRUST

By I. W. Cooper, M.D.,
Newton, Miss.

The activities of the medical profession in the last fifty years have been great, and have become greater with each passing year. No phase of life has been left untouched. The personnel of the profession has been raised to a very much higher standard, and a great advance in the accomplishment of the purposes of the profession has been made.

The physician is the conservator of the health of the people. To him is entrusted the vast responsibility of treating the sick and conserving the health of the well. That the profession has a keen realization of the gravity of these responsibilities, the accomplishments of the recent past attest.

A "trust" in the every-day acceptation of the term is an association of persons who have, or whose sole purpose is to have, complete domination of a single field of human endeavor, and who are unscrupulous and oppressive in the exercise of the power, or are unscrupulous in their efforts to obtain this power. This may not be a legal definition of the term and no doubt is not, but to the average man my definition is the idea the word conveys to his mind. It is a monopoly which exercises its powers in a brutal and oppressive manner.

The medical profession is by nature a monopoly. It, and it alone, has the burden of conserving the health of the people. No other calling in life even attempts to invade this field in a legitimate way. We are left to ourselves and we are possessed of the powers of a monopoly.

The day of individual effort alone has long since passed away. Every walk of life has recognized it. The trade unions, the corporations, the associations, and other organizations all bear witness that experience has taught that united efforts have proven more useful and effectual than the same efforts without combination. And the medical profession has seized this truth, and medical associations have sprung up throughout the civilized world. Inspired as they were by the desire to benefit the individual, by a desire to provide a place, as one has said, "Where a system of transportation in the kingdom of mind, by which the ideas, discoveries and experience of the isolated and individual seeker after truth find their way into the thought and usage of our whole profession," might be installed, the associations have reached out, have extended their bounds, and have become dynamic forces in the life of the people.

With the advance in medical science, the association has come to know and to realize the great possibilities of its field of operation. Time was when the whole concern of the doctor was the patient treated. Now his concern is not that alone, though it has not abated, but he is concerned with the effect of that illness on the well. His efforts are for the well as for the sick. He has come to know that his work is not only for the patient, but is a community work, a district work, a state work, and even a national work. This conviction has evidenced itself in the associations,—it is evidenced here. And these convictions find unified expression through these associations, just as much and as firm, though in range of influence different, in the county associations as in the American Medical Association.

So it has come to be that the individual doctor feels that his responsibility is greater and covers a wider field than ever before. So it is that the individual has voiced his ideas and convictions through the Association. The underlying and basic thought is that the health of the people is the care of our profession, and it is our duty to take such steps as the accomplishment of the ends desired may warrant, cost what it may.

Impressed by this truth, and inspired by no motive than that of doing our duty, the medical profession has set out to carry as best it can the great burden which the nature of things has cast upon it. There have been no selfish interests prompted, but selfish interests have been defeated.

There is a class of human vultures whose sole asset is a knowledge of the foi-

*Presidential Address, Mississippi State Medical Association, Greenville, Miss., May, 1916.

bles of human nature; a keen knowledge of how the sick grasp with a burning hope any remedy that may offer a relief from pain and restoration to health. They realize that when health is the end sought the dollar is gladly spent. With conscienceless deliberation they have prepared so-called remedies and by the judicious use of money have carried to the pain-racked minds of the sick a ray of hope. Money has flowed into their coffers in an unending golden stream, and it is only at the last when all hope has faded and "life's fitful fever" is nearly over, that the sick realize that they are the prey of depraved and consummate scoundrels.

And then again, we find human lives that are wrecked by habit-forming drugs which have come into their homes under the guise of a cure for existing ills. How many homes there are whose foundations have been destroyed by the vendors of nostra I can not say. How many innocent lives have become burdens through the use of habit-forming drugs I can not say. But your experience teaches you, as it teaches me, that these vampires and harpies are in many cases worse than murderers. Their evil effects have been transmitted to other generations, giving us boys and girls who start life without a chance, and eventually become public burdens.

This the medical profession realizes. It realized that through education alone could this evil be remedied. This task it gladly undertook and is now earnestly engaged upon. And in doing so, it has called upon its head the wrath of these monsters. And with the money filched from their prey they have endeavored to stifle the voice of the medical profession by the loud and vociferous roar of "Medical Trust." They have taken the money stolen practically from the casket and have organized leagues of medical freedom,—have subsidized the secular and religious papers to echo their cries and charges.

The quack, the layer-on-of-hands, the cancer cure grafter and all of the so-called cults who prey upon the poor and ignorant have taken up the charge and passed it along. If one could paint with a master hand a picture which truthfully portrayed the evils of the vendor of patent medicines and the quack whose avarice leads him to wreck the lives of others, the horrors of Dante's "Inferno" would pale into faded insignificance. If such a picture could be drawn, the artist would of necessity portray a devil with brutality and love of suffering in others magnified ten thousand times that which we are accustomed to accuse his Satanic Majesty of having. Such a picture would make the horrors of Verdun, with its thousands of corpses, with its chorus of groans and shrieks, seem as trivial as that of the sparrow's fall. Yet, in combating such an evil, we are accused of exercising our power for a selfish end.

So it is that we stand opposed to this army of fiend-producers and body-destroyers. Their battle cry is "Medical Trust."

These are the only instances where our powers have been unhesitatingly employed to the injury of others. We are meeting our responsibility. Does this make us a trust? If it does, I hope we shall always remain so. These are the facts to support the charges. Are we guilty? The American people are answering the question, and the time is not far distant when the answer will be recorded upon every statute book.

But there is a "Medical Trust;" and it is the great heritage of our profession. It is the moving and inspiring force behind every doctor who loves his profession and who reflects upon the transcendant glories of his profession. It is the source of his courage in his fight against ignorance and superstition. He receives a new reflection of it when he looks into the pallid face of one whose life has been wrecked and whose end has been hastened by these soulless leeches who prey upon the helpless and hopeless. The thought of it is the cause of his sacrifice when his land is scourged by disease. This is the power which moves him to lay his own life on the altar of experiment. It is more powerful than all the forces of nature harnessed into one, because it is the moving inspiration of immortal souls. It is akin to that spirit which led Christ to Calvary.

And I say it is a "Medical Trust." It is the confidence of our people that the medical profession will leave nothing undone to safeguard their health and homes. They look to us as their guardians, and their confidence is our trust,—a more sublime trust, man can not bestow.

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Next Meeting, Atlanta, Ga., Nov. 13, 14, 15, 16, 1916

EDITORIAL DEPARTMENT

THE CAFFEINE BEVERAGES

Caffeine is one of the most powerful and one of the most useful drugs employed by the medical profession. It is our best cerebral stimulant. In small doses, 2 to 3 grains, it increases mental activity, produces wakefulness, and a feeling of mental and physical vigor. Hence its delightful effects, particularly when one is fatigued. But like other stimulants and habit-forming drugs its use is followed by a period of depression that calls for another dose.

In large doses, from 8 to 15 grains, caffeine produces a toxic delirium which is soon followed by a stupor; and in still larger doses it will cause death from respiratory failure. In other words, caffeine like the other chemical toxins, morphine, cocaine and alcohol, if used in large doses, will produce intoxication to the extent of delirium. Caffeine is first a cardiac stimulant, increasing the frequency and strength of the heart's action, but its effect in this way is soon lost by its influence upon the inhibitory centers. The heart slows down while the force of the systole is increased.

Caffeine is the best diuretic, having a selective stimulating effect upon the renal tubules, and at the same time raising blood pressure — acting very much like digitalis.

In the last edition of the "Reference Hand-Book of Medical Sciences," Vol. II, p. 571, Dr. Beaumont Small says that, "In valvular diseases and in conditions in which the heart is being overtaxed, even ordinary doses of caffeine may be attended by serious consequences." He cites three deaths that occurred from moderate doses employed in diseased conditions.

Is it not wondrous strange that educat-

ed, well informed, people constantly use so powerful a drug as a beverage? That the savage or heathen tribes, who first learned, accidentally no doubt, that the infusions of their native plants had an agreeable effect, should have formed the habit of using them without knowing their consequences, was as natural as for the Chinese to smoke opium or for the Syrians to eat arsenic. The Chinese had formed the caffeine habit from drinking infusions of tea leaves, the Arabs from coffee seed, the Africans from kola nuts, and the natives of South America from mate and guarana, long before civilized man ever visited their countries.

When commerce was first established between the civilized countries of Europe and China and Arabia, the sailors learned from the natives the use of tea and coffee, and they carried them back home with them. The hotels and boarding houses for sailors soon began to import tea and coffee for the use of their customers; and then when it came to have a commercial aspect. The caffeine habit extended first among the inhabitants of the seaports, then to the cities of the interior and lastly to the rural districts, until the use of coffee and tea became almost universal throughout the civilized world.

With the advent of the soda fount in the United States, as a commercial adjunct to drug stores, came the quest for beverages that would please the palates of the populace, or that would have an exhilarating effect, so that patrons would come back for more. One enterprising druggist, who evidently knew that caffeine was the active principle of coffee and tea, and who probably reasoned that if people drank several cups of coffee, or a number of glasses of tea each day that the same amount of caffeine in soda water would have the same effect. He tried it and soon people were walking blocks to his drug store for this new beverage to which he gave a mysterious name.

This druggist evidently knew the principles of success in selling patent medicines,—i. e., first, use some drug, the "repeater," that would create a desire for the second and the hundredth dose; secondly, give it a name that was "catchy," easily remembered, and descriptive of ingredients supposed to be quite out of the ordinary and from far distant countries; and thirdly, properly advertise the product.

Soon the customers of other soda founts in the same city began calling for the new drink, which was patented, and they had to buy it from the patentee. Then other towns and cities called for it, and because of judicious advertising, and the "come back" in it, its spread in a very few years was nation wide.

Other druggists found that caffeine was the ingredient that made customers come back and they prepared substitutes, which were widely advertised, until now there are dozens, or hundreds, of caffeine beverages sold at soda founts throughout the country, particularly in the South. Their use has extended to the rural districts; and everywhere from the store with a side of meat, a bag of meal and a box of tobacco, to the city emporium these caffeine beverages are temptingly advertised and sold.

The use of these drinks is not only widespread among young men and women, but business and professional men, even physicians, must have several "dopes" a day; and everywhere children from four and five years old and upward may be seen drinking soda water with two or three grains of caffeine in each glass or bottle.

The writer believes that from a study of the physiological effects of caffeine and alcohol, and from a rather extensive experience in treating habitues of both drugs, he is justified in making the state-

ment that six cups of coffee or tea, or the same number of glasses or bottles of the caffeine beverages that are sold at soda founts, will produce digestive and intestinal disturbances, and will result in degenerative changes in the brain, arteries and kidneys quicker, and of a more serious nature, than will result from the ingestion of six drinks of whisky, or six bottles of beer a day. He has seen a number of cases of nephritis, many cases of general arteriosclerosis, and hundreds of cases of digestive disturbances that he believes could be traced to the excessive use of coffee, tea or the soda beverages containing caffeine.

In a recent address, Dr. J. T. Searcy, Superintendent of the Alabama Hospital for the Insane, classified caffeine as one of the toxins responsible for the degeneracy that is causing the increase in insanity among civilized people. Statistics show that the other degenerative diseases of the arteries, heart and kidneys, are increasing at an alarming rate. Statistics also show an astounding increase in the annual consumption of caffeine from tea leaves, coffee seed and kola nuts. Even a casual study of the question is convincing that caffeine is one of the important causes of the increase in the diseases that shorten life.

Ulcer and cancer of the stomach have also increased very greatly in the past three decades. W. J. Mayo thinks that hot drinks may cause ulcer of the stomach and that cancer usually follows ulcer. Having so frequently observed the irritating effect of the caffeine beverages, both hot and cold, upon the stomach, the writer thinks it entirely possible that their excessive use over a long period may have some relationship to the increase in gastric ulcer and cancer. Robert Abbe and others have proved the case against tobacco as causing cancer of the mouth. May not the presence of an irritant, such as caffeine, in the stomach for several hours a day, over a period of many years, finally result in ulcer or cancer of that viscus.

Is not a human life lost from a degenerative disease, as valuable as one destroyed by typhoid fever or other acute infections and contagious disease? It is high time that the medical profession was seriously taking up the study of the causes of the degenerative diseases; and when this is done, the writer believes that caffeine will be condemned like alcohol as one of the toxins that is shortening the lives of the adults of the human race.

It is the duty of physicians to inform the public of the harmfulness of drinking beverages containing a powerful, habit forming drug like caffeine. Through the activities of the medical profession in educating the laity, tuberculosis, typhoid fever and other diseases have been very greatly decreased. It surely seems quite as important to let the public understand the causes of, and the methods for preventing, the increasing cardio-vascular-renal and other degenerative diseases.

INFANTILE PARALYSIS

The presence in New York City of an epidemic of poliomyelitis with an unusually high mortality rate, and the appearance in other cities of cases of Heine-Medin's disease, have aroused widespread and justifiable apprehension. Since the first great epidemic in this country, in 1907, which is thought to have come from Sweden, and which spread rapidly to every state in the Union, there have not been so many cases nor so many deaths as at the present time.

The statistics of New York City for July 14, 1916, showed a total number of 1,557 cases during this epidemic, with 311 deaths, or an apparent mortality of a frac-

tion less than 20%. But if one considers the vast number of cases which are not reported because of negligence, faulty diagnosis, or that are unrecognized because of the mildness of the attacks and the absence of paralysis, it will readily be seen that the real mortality is much lower than that stated.

The Secretary of the Treasury, McAdoo, has offered the services of the U. S. P. H. officers for the study of the epidemic. This has been accepted by the City. Likewise, Congress has been asked for $135,000 for the prevention of the spread of infantile paralysis, and also for its study with a view to learning its chief means of transmission.

Although poliomyelitis is known to have existed prior to that time, it is to J. Heine* of Cannstadt, Wittenberg, Germany, to whom credit is due for the first comprehensive study of this disease, which he published in 1840. Following that, no great advance was made in the knowledge of infantile paralysis 'till 1890, when O. Medin, of Sweden, published his observations. Later, Wickman, Charcot, and in our own country, Simon Flexner, Landsteiner, Popper, Lewis, Noguchi, and others, have added materially to our knowledge of the subject.

It has long been noted that the disease flourishes during the warm Summer months only to disappear at the approach of Winter. Yet its virus is not killed by freezing for eleven days, but is destroyed by 50° C. for a short while.

Since it is a filterable virus, being capable of passing through an unglazed porcelain filter, it was thought to be an ultra-microscopic organism. However, it has been demonstrated with a Romanowsky stain to exist as "minute, violet, rounded-oval bodies, singly, in pairs, and in chains." They are 0.2 micron in diameter (one thirty-fifth the size of a red blood corpuscle), non-motile, and are Gram-positive.

An authoritative paper on poliomyelitis was recently read by Dr. Simon Flexner, Director of Laboratories of the Rockefeller Institute for Medical Research, New York, under the auspices of the New York Academy of Medicine, and copies were furnished the daily press**.

He mentions the facts that the virus escapes from the body in the secretions of the nose and throat, and in the intestinal discharges; that it enters the system by way of the mucous membranes of the nose and throat, and possibly at times through the medium of the house fly; that sneezing, kissing, contaminated clothing, etc., may convey the disease; that there are healthy carriers of the infection; that it spreads by routes of travel; that the incubation period is from two days to two weeks or more; that one attack seems to confer absolute and lasting immunity, no matter how mild the illness may have been; and that some success has been obtained in the use of blood serum from recovered monkeys and human beings, but that the amount of available material is too scarce to be of practical value.

Furthermore, Flexner tells us that children are not near so susceptible to the disease as they are to diphtheria, measles, or scarlet fever.

Throughout the South there are a number of cases being reported; but it is to be hoped that they are sporadic, that they are no more than the usual number, and that they are not caused by the virulent strain of organism which is now epidemic in the East.

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*Barker, L. F.: Monographic Medicine, Vol. II., pp. 392-404.

**Printed in full in New York Tribune, July 14, 1916, pp. 1 and 6.

SHALL THE FAHRENHEIT THERMOMETER BE ABOLISHED?

Physicians will be interested to know that Congressman Albert Johnson, of Washington, has introduced in the House of Representatives a bill (H. R. 528) to discontinue the Fahrenheit thermometer in Government reports. It reads as follows:

"Be it enacted, etc., That the centigrade scale of temperature measurement shall be the standard in the United States Government publications, the use of the Fahrenheit scale being discontinued, at the option of the heads of departments or other independent branches of the Government, either immediately upon the signing of this bill or at any time before January 1, 1920, except as provided in Section 3.

"Sec. 2. During the period of transition the Fahrenheit equivalent of centrigrade degrees may be added in parenthesis, or as a foot note, or in any other way if in the opinion of the heads of departments or independent officers it seems necessary.

"Sec. 3. The use of the Fahrenheit scale shall be permitted after January 1, 1920, in cases where it is required by state or municipal law, or in certificates of tests of instruments graduated in the Fahrenheit scale."

Before Mr. Johnson presented his bill to Congress he submitted it, with question blanks for criticism, to 200 scientific men throughout the country. One hundred and thirty-eight replies were received, of which 131 expressed themselves as being favorable and 7 as unfavorable to the proposition. We believe that physicians generally will approve of the change from the Fahrenheit to the centigrade scale.

In 1720, Gabriel Daniel Fahrenheit, a German, arbitrarily called the boiling point of water 212°. He then called the lowest temperature obtainable by mixing ice and salt 0°. Naturally, in such a scale the freezing point of water fell at 32°.

Anders Celsius, Professor of Astronomy at the University of Upsala, Sweden, in 1742, devised the centigrade thermometer. And very wisely he designated the freezing point of water as 0° and the boiling point as 100°.

Some of the arguments brought out by the advocates of the change to the centigrade are:

1. That the centigrade scale is the recognized standard for all civilized governments save the English-speaking countries. "The fact that so many nations have united on the centigrade scale is an a priori reason for thinking there must be some advantage for it over other scales."

2. That the method is in use by all scientific men the world over.

3. That the transition would be gradual, since the Fahrenheit equivalent could be given in parenthesis for a period say of eight or ten years.

4. That the greater difference represented by a degree centigrade as contrasted with Fahrenheit would have a tendency to render the various temperatures more capable of conveying a definite meaning.

5. That the whole world would have a uniform scale.

6. That much valuable time now consumed in translating the one scale into the other would be saved.

7. That the Weather Bureau, the great source of temperature data, can not make the change without congressional sanction. If that bureau were authorized to use the centigrade, the public would acquire the new habit almost instantly and without effort, and would welcome the simplicity just as they welcome the simplicity of standard time. The only landmark they would have to fix in their minds would be normal blood heat, about 98.6 F., which would thereafter be called 37° C.

8. That if our fathers had not had some initiative we would still be using the

clumsy English monetary system in the place of our decimal system.

9. That Fahrenheit's mistake in the placing the zero not at freezing point, but 32° below it, has been perpetuated for 195 years simply because nobody has taken the trouble to propose its discontinuance.

DISTRICT AND INTERSTATE MEDICAL SOCIETIES

That the district and interstate medical societies have a place among medical organizations was demonstrated by the recent and most successful meeting of the Chattahoochee Valley Medical Association in Alexander City, Ala., on July 11-13, at which time and place its tenth anniversary was celebrated. This organization, which was originally founded with the idea of bringing together the doctors of a few counties in the Chattahoochee Valley, has proved its worth to those who have enjoyed its privileges until it now has a membership of more than 300 among the physicians of Georgia and Alabama who are convenient to its meetings.

There are a number of similar organizations, some with membership limited to a congressional district, and others covering two or three states, that are serving an admirable purpose in stimulating interest in scientific and practical medicine, particularly among the general practitioners in their respective territories. They also bring about a spirit of fellowship and mutual regard among the physicians of the various towns and cities that can result only from the intimate association in traveling to and in attending such meetings.

These district or interstate societies are usually independent medical organizations, with no relation to the county, state or other associations, nor are they in any way antagonistic to them. They are also usually free from medical politics. It was noticeable at the meeting of the Chattahoochee Valley Medical Association that its members are those who are most interested in their county, state, regional and National associations. The same may be said of other similar organizations.

The Southern Medical Association wishes for these independent medical societies continued usefulness and prosperity. Indeed our regional and the National associations are benefited by them in that they stimulate an interest in medicine generally and train physicians for work in the larger associations.

The next meeting of the Chattahoochee Valley Medical Association will be held at Warm Springs, Ga., the second Tuesday in July, 1917. Dr. B. L. Wyman, of Birmingham, was elected President, and Dr. W. J. Love, the founder and moving spirit of the Association, who has been Secretary for ten years, was re-elected for another term of five years.

THE NATIONAL BOARD OF MEDICAL EXAMINERS

To the lamented William L. Rodman belongs the greatest credit for the creation of the National Board of Medical Examiners. The need for a board of medical examiners that could give license to practice medicine in any part of the United States has been discussed for many years, but Dr. Rodman, as one of the last acts in his brilliant and useful career, took up the subject and with his characteristic energy and ability pushed it to its final conclusion.

The National Board of Medical Examiners is not a legal body and has no relation to the National Government. It is a voluntary board composed of fifteen of the most distinguished men in governmental and educational work. The following members of the Southern Medical Association are on the Board: Surgeon-

General W. C. Braisted, U. S. Navy, President; Col. Louis A. La Garde, U. S. Army, Treasurer; Surgeon-General W. C. Gorgas, U. S. Army; Surgeon-General Rupert Blue and Assistant Surgeon-General W. C. Rucker, of the U. S. Public Health Service; Medical Director E. R. Stith, United States Navy, and Dr. Isadore Dyer, Dean at Tulane Medical School, New Orleans. The other members are well known educators from various sections of the country. It is fitting that the mantle of Secretary should be placed upon the distinguished son of the founder, and Dr. J. S. Rodman at Philadelphia is the executive officer of the Board.

The first examination will begin October 16 and will last about one week. In addition to the written examination, the applicants will have oral, laboratory and clinical tests in the Army and Navy Medical Schools, Hygienic Laboratory of the United States Public Health Service, and in the Government Hospitals.

The Board does not give a license to practice medicine, but because of its high standards, the certificate of the Board will likely be accepted by most, if not all, the medical examining boards of the various states as satisfactory evidence that a physician should, without re-examination, be granted license to practice in any state.

The applicant for examination must be a graduate of a class "A" medical school and he must have had one year as interne in an acceptable hospital or laboratory. The only expense of the examination is a five-dollar registration fee.

THE JOURNAL would advise recent graduates who have had the necessary training to go before the National Board, because its certificate will give prestige to any physician; and will likely, also, give other advantages that have not been mentioned.

Dr. J. S. Rodman, 2106 Walnut Street, Philadelphia, will furnish further information regarding the branches covered and the requirements for admission to the examinations.

BARKER'S MONOGRAPHIC MEDICINE

The friends of Dr. Lewellys F. Barker, who have known for some time that he was at work preparing an exhaustive treatise on the clinical diagnosis of internal diseases, expected it to be thorough, accurate and scientific in every detail. They are not disappointed, because the three volumes which he has contributed to "Monographic Medicine," which is fresh from the press of D. Appleton and Company, represent the greatest work on diagnosis ever published. Indeed, there is no other work on the subject that compares with it.

The first volume by Dr. Barker, Volume II of "Monographic Medicine," discusses general diagnosis, the infections and diseases of the respiratory and circulatory systems; Volume III, the blood, digestive system and urology; Volume IV, diseases of the muscles, bones and joints, nervous system and metabolism. The three volumes therefore cover the entire field of internal diseases; and the reviewer can find no diagnostic aid or procedure of any value, with which he is familiar, that is not discussed fully though in the concise, direct style of the great internist who is the author.

In the text it is shown that the perfected methods and technique described are collaborated from the records and the experience, not only of the distinguished author, but of the other members of the staff of the Johns Hopkins Hospital, in which the writer believes is done the most scientific, thorough and practical work in diagnosis of any hospital in the world.

It is not possible in an editorial review even to outline the special and distinctive

features of Barker's "Monographic Medicine." The chapters on general diagnosis and infections are masterpieces; but are no better than the systematic descriptions of the symptomatology and the special examinations employed in the diagnosis of all the internal diseases.

The originality and individuality of the author, with his comprehensive understanding and viewpoint of disease processes, is evident on every page, and adds much to the interest in the text, particularly to those who have had the opportunity of knowing something of Dr. Barker's work in the Johns Hopkins Hospital and Medical School.

An important feature, and one of very great value, is the list of references which follows every subject discussed. To one who desires to study any particular disease or diagnostic method, with the references given, he can easily get all the literature of importance on the subject. Wherever possible, the author has given reference to American writers, though to make the bibliography complete he has added the references to foreign literature as well. It is pleasing to see the frequent references to articles published in THE SOUTHERN MEDICAL JOURNAL and other journals throughout the South. Such recognition, by a man so distinguished as Dr. Barker is gratifying to those who have watched the wonderful development of scientific medicine in the South during the past decade.

The authors of the other three volumes of "Monographic Medicine" are celebrated clinicians who were selected because of their special fitness to discuss the subjects necessary to round up a comprehensive treatise of internal diseases. The volume on Functional Pathology by A. W. Hewlett, Professor of Internal Medicine in the University of Michigan, presents in a most attractive manner the disturbances of function of the various internal organs, with the recent advances in physiology, biochemistry, immunology and experimental pathology that have thrown much light on disease processes. Pathological physiology has been too much neglected in medical text-books,—hence the great value of this unusually well prepared monograph by Dr. Hewlett.

The volume on Differential Diagnosis by M. H. Fussell, Professor of Applied Therapeutics in the University of Pennsylvania, is an able and concise though thorough presentation of the differential points in the diagnosis of internal diseases. It is of great value to the student and will prove an "ever ready help in time of need" to the physician who is uncertain of the diagnosis, and therefore in the dark as to the treatment, of an internal disease.

The volume on Prognosis of Internal Diseases, by Henry L. Elsner, Professor of Medicine in Syracuse University, is the first book on the subject that has ever been written. This fact added to the sane and practical way in which the author discusses the various symptoms and conditions that affect the course of various internal diseases makes it a most valuable contribution to medical literature.

The Appletons, realizing the value of the text of "Monographic Medicine," in the typographical work, and general make-up of the six volumes have shown the heighth of excellence in the publishers' art. Each volume is profusely illustrated and the colored engravings are beautiful.

It is unusual for THE JOURNAL to give so much space for an editorial review of books, but we feel that the medical profession should be informed of the value of "Monographic Medicine," the appearance of which is an event of great importance to physicians who desire to practice modern, scientific medicine.

THE SUPPLY OF SALVARSAN AND NEOSALVARSAN

The European war, with the blockade of Germany, for a time cut off the supply of Salvarsan and Neosalvarsan; and most of the small supply on hand in this country fell into the hands of speculators, who demanded outrageous prices for the product; and finally none could be had at any price.

In order to meet the need for this drug, which has become indispensable in the treatment of syphilis, several American and Canadian laboratories produced arsenical products which are said to have been identical with Ehrlich's "606." The JOURNAL believed that the matter was of such importance that editorial mention was made of one of them, giving the address of the laboratory and other information which was thought to be of interest to the medical profession.

Recently it was arranged for a cargo of German medicines and chemicals to be brought to America, and the American selling agents of Salvarsan and Neosalvarsan, the Farbwerke-Hoechst Company, of New York, announce that they received a sufficient supply of these drugs to meet the demands. It will be sold only to physicians and hospitals at the price which was in vogue before the European war, namely, $4.50 per ampule. The evident desire of the exporters to prevent speculation and to protect the medical profession is greatly to be commended.

BOOK REVIEWS

Painless Childbirth, Eutocia and Nitrous Oxid-Oxygen Analgesia

By Carl Henry Davis, A.B., M.D., Associate in Obstetrics and Gynecology, Rush Medical College, in Affiliation with the University of Chicago; Assistant Attending Obstetrician and Gynecologist, Presbyterian Hospital, Chicago. 134 pages. Chicago: Forbes & Co., 1916. Cloth, $1.00.

Davis reviews the history of anesthesia and analgesia in obstetrics, including the pharmacology, toxicology and comparative merits of each. His conclusions are all in favor of nitrous oxid-oxygen analgesia to produce eutocia rather than Dammerschlaf to obliterate the memory of pain. While nothing especially original is presented, the subject is ably handled in a thoroughly readable style.

Candy Medication

By Bernard Fantus, M.D., Professor of Pharmacology and Therapeutics, College of Medicine, University of Illinois, Chicago. St. Louis: C. V. Mosby Co., 1915. Cloth, $1.00.

To those who have long become accustomed to the nose-holding form of drug administration in children, this little volume should prove of unique interest; for Dr. Fantus has produced "the only book on the subject (of candy medication) in any language." He tells us that as a result of his investigation and experiments, more than fifty medicinal agents can now be administered in this palatable form. The author takes up in detail the question of taste, color, and the actual pharmaceutical technique employed in the preparation of these confections.

Gould's Practitioner's Medical Dictionary

Third Edition. Revised and Edited by R. J. E. Scott, M.A., B.C.L., M.D., of New York. 962 pages. Philadelphia: P. Blakiston's Son & Co., 1916. Flexible Cloth, $2.75.

This book is gotten up in an attractive form. The pages are thin and it is consequently quite light. We have had occasion to make frequent use of it of late, and have always been well pleased with the information furnished.

Syphilis as a Modern Problem

By William Allen Pusey, M.D., Professor of Dermatology in the University of Illinois. 127 pages. Chicago: American Medical Association, 1915. Cloth, 50 cents; paper, 25 cents.

In the book, syphilis is treated as much from the standpoint of the layman as of the physician. However, it is not handled with the wild frenzy of a "vice crusader," but in an historical and scientific way. The word completeness expresses both its aim and accomplishment.

It spans a wide chasm between the intelligent layman on the one side and the physician on the other. We heartily recommend the work.

Publications from the Jefferson Medical College and Hospital

Vol. VI. 190 pages. Illustrated. 1915.

All the articles are original; none has been published elsewhere; and some are really most

excellent monographs. One of these is the article upon "Osteitis Deformans," by Da Costa, Funk, Bergheim and Hawk.

Physical Diagnosis.

Third Edition. Revised Principles and Practice of Physical Diagnosis. By John C. Da Costa, Jr., M.D., Assistant Professor of Medicine, Jefferson Medical College, Philadelphia. Octavo of 589 pages with 243 original illustrations. Philadelphia and London: W. B. Saunders Co., 1915. Cloth, $3.50 net.

This book needs no introduction to the profession, having proven its worth as a text-book of physical diagnosis in its earlier editions. The subject matter is arranged and presented in the same manner as before, the main revision being made to keep abreast with the advance in the subjects of vertebral percussion, sphygmomanometry, electro-cardiography and gastric-radiography. The work recommends itself to students of this all-important art as a very clear and thorough exposition of the subject.

The Clinics of John B. Murphy, M.D.

At Mercy Hospital, Chicago. Vol. IV, No. 6; Vol. V, Nos. 1 and 2. Published Bi-Monthly. Philadelphia and London: W. B. Saunders Co. Per year, $8.00.

Each time it becomes our duty to review "Murphy's Clinics" we find we have exhausted our terms of praise in the previous notices. The fact is, they all measure up to a high standard. There is the usual collection of cases of masterful bone surgery, interspersed with a great variety of material, all of which is interesting. The "Talk on Certain Aspects of the Metastases of Cancer" is the most clear and enlightening discussion of the subject we have seen.

Medical and Veterinary Entomology

A Text-Book for Use in Schools and Colleges as well as a Handbook for the Use of Physicians, Veterinarians and Public Health Officials. By William B. Herms, Associate Professor of Parasitology in the University of California, Consulting Parasitologist for the California State Board of Health, and formerly Professor of Zoology and Parasitology in the San Francisco Veterinary College. 392 pages. Illustrated. New York: The Macmillan Co., 1915. Price, $4.00.

"Medical Entomology is concerned with the study of insects and arachnids as they relate to the transmission and causation of disease in man and beast, and is, therefore, a specialized branch of the science of Parastiology. . . . This science shares a portion of the fields of Pathology, Bacteriology and Entomology; the first, in that certain phases of pathology are evolved; the second, in that pathogenic bacteria and protozoa are concerned; and the third, in that the systematic and biological relationships of the insect must be studied as well as the morphology of its mouth parts and digestive system."

Medical Entomology as a branch of Parasitology is a relatively new offshoot. The author's profound knowledge of the subject, together with his many years of training as a teacher, have enabled him to produce an authoritative work.

The Starvation Treatment of Diabetes

With a series of Graduated Diets Used at the Massachusetts General Hospital. By Lewis Webb Hill, M.D., Children's Hospital, and Rena S. Eckman, Dietitian, Massachusetts General Hospital, Boston. With an introduction by Richard C. Cabot, M.D. Second Edition. 131 pages. Boston: W. M. Leonard, 1916.

First, there is a brief discussion of the Allen treatment; secondly, a series of illustrative cases; thirdly, a short treatise upon urinalysis; fourthly, a set of recipes of diabetic dishes, including many delicacies; fifthly, forty-eight graded diets; and sixthly, some tables of food with their protein, fat, carbohydrate, and caloric values. It is a very simple, practical and useful little book.

The Medical Clinics of Chicago

Vol. I, Nos. 1, 2, 3, 4, 5, and 6. Philadelphia and London: W. B. Saunders Co. 1915-1916. Bi-Monthly. $8.00 per year.

During the last two decades in America, case teaching has become very popular. It began with law schools and was later adopted by medical colleges. Nowadays, it is almost a safe rule that the more stress placed upon case teaching in a medical school, the higher the type of institution.

The volumes under consideration are, as their name would indicate, carefully prepared stenographic reports of the various medical clinics of Chicago. They have been well edited and in many instances are illustrated. It is a means of rapidly disseminating advanced medical thought throughout the country. In that way they serve a most useful purpose.

If we were to offer any criticism whatever, it would be that the pathology of the cases seems to be neglected to a large extent. Modern medicine owes so much of its progress to pathology that it would certainly seem unwise to curtail a branch which has been, and which is still, of so much importance in the intelligent interpretation of disease.

We were especially impressed by the very instructive clinic of Dr. Frederic Tice, in No. 5, called "Typhoid Fever Resembling Pneumonia," in which the subject of typhoid is handled in a most practical manner, especially as regards diet. We were rather surprised, however, that nothing is said of the care of the bowels. But as the article does not purport to be an exhaustive treatise upon the subject of typhoid, perhaps the doctor will take up that point in some future number.

In the same issue Dr. Isaac A. Abt's discussion of "Congenital Syphilis" is a classic. Other clinics of great merit are that of Dr. Tice in Number 2 on "Heart Disease in Pregnancy. Induction of Therapeutic Abortion and Premature Labor. Treatment to Prevent Artificial Termination. The Question of Marriage in Relation to Each Type of Cardiopathy in Both Male and Fe-

male;" and the clinic of Dr. Abt, in Number 1, on "Infantile Tuberculosis."

We believe "The Chicago Clinics" are destined to exert a wonderful educational influence upon the profession at large; for they furnish in fresher and more pleasing form a greater amount of recent knowledge than is possible to be obtained from the latest text-book. It is the next best thing to being at the actual clinic itself.

A Synopsis of Medical Treatment

By George C. Shattuck, M.D., Assistant Physician to the Massachusetts General Hospital. Second Revised Printing of the Second Edition. 185 pages. Boston: W. M. Leonard, 1915. Price, $1.25.

This is really a most useful little pocket manual, giving an outline of the scientific treatment of a few of the more important diseases as employed by a group of celebrated internists at the famous old Massachusetts General Hospital. A further and very valuable feature of the work is its short discussion of the more common drugs.

While compiled primarily for Harvard students, it may be read and studied to great advantage by the practitioner.

SOUTHERN MEDICAL NEWS

ALABAMA.

At Birmingham, it has been decided by the authorities that the recent typhoid epidemic was probably due to infected ice cream.

At Birmingham, Dr. R. M. Cunningham has resigned his position as City Health Officer.

At Birmingham, the Jefferson County Anti-Tuberculosis Association has been doing commendable work. According to their official report, 107 patients have been cared for at the hospital and more than 1,000 patients have been handled by the dispensary and out-patient departments.

At Montgomery, it has been decided by the anti-tuberculosis association of that city, that only incipient cases may be cared for in the fresh air camp.

Surgeon L. L. Lumsden, typhoid epidemiologist of the United States Public Health Service, was in Birmingham during the first of July in connection with the fight against the spread of typhoid fever.

Surgeon Carrol Fox, of the U. S. Public Health Service, is in Birmingham investigating the sanitary conditions with the view of recommending to the board of health plans and ordinances for an adequate health department for Birmingham and Jefferson County.

Deaths.

Dr. J. L. Williamson died suddenly at his home in Tuscaloosa on June 19. His death was due to heart trouble.

ARKANSAS.

Dr. R. H. VonEzdorf is in charge of the anti-malarial work in Chicot and Ashly counties which, though being done under the direction of the United States government, is financed by the Rockefeller Foundation. These communities have been cleared of the infection by the very effective work.

The residents of Logan county, who petitioned for a rescinding of the act requiring the vaccination of all school children, have been notified that the act is still in force and must be complied with.

At Little Rock, at a meeting of the Arkansas Society for the Prevention and Study of Tuberculosis, the scope of the work was considerably broadened and Dr. T. B. Bradford, of Cotton, was elected field secretary. He will make tours through the country in an effort to educate the public in the best methods of fighting this disease.

Deaths.

Dr. Robert Andrew Hilton, age 47, died at an infirmary in Little Rock and his remains were interred in El Dorado.

Dr. G. A. Hogg, 77 years of age, and a pioneer citizen of the state, died at his home in Ellerson on June 24.

Dr. Francis M. Lewis, 61 years old, died after an operation for appendicitis. He was one of the oldest practicing physicians in Little Rock.

DISTRICT OF COLUMBIA.

Deaths.

Dr. Francis Sorrel died at his apartments in Washington on June 30. He was 89 years of age and was at one time assistant surgeon of the United States Army.

FLORIDA.

At Jacksonville, as an evidence of how rigidly the health authorities are enforcing the law requiring the registration of all births and deaths, several of the most prominent physicians were fined for failure to comply with this regulation.

Twenty applicants were examined by the State Board of Health for vacancies in the district public health nurses' staff.

Miami has carried on a vigorous and effective campaign against the mosquito during the past month.

An experimental papaya plantation has been planted about four miles west of Little River, and if the experiment is successful this site will be used for the growth of these plants, from which papain is prepared.

At Pensacola, Passed Assistant Surgeon C. P. Knight has been placed in temporary charge of the quarantine station.

At Jacksonville, the State Board of Examiners met on June 14 and 15 and examined a large number of applicants.

The Florida Health Exhibit Cars have been doing a widespread work in educating the people in sanitary matters, having traveled nearly five thousand miles since they were first placed in commission.

GEORGIA.

The State Board of Medical Examiners met in Atlanta on July 1 and examined a number of applicants.

At Augusta, ten graduates in medicine received their degrees from the Medical Department of the University of Georgia on May 31.

Deaths.

Dr. W. J. Bell, a prominent Atlanta physician, died suddenly at his home on Peachtree street on June 17.

Dr. Theodore Roan died at Townsend on June 30. He was 63 years old and a citizen of Waycross.

Dr. E. W. Dean, of Hiram, Georgia, died in an Atlanta sanitorium, on July 4.

Dr. I. R. Aultman, Meigs, Georgia, died at his home in that city on June 23.

KENTUCKY.

There were fifty-five graduates from the University of Louisville during the last session.

At Richmond, at a meeting of the Kentucky Valley Medical Association, on June 30, the following officers were elected: Dr. Clarence H. Vaught, president; Dr. Wilson Bach, Jackson, vice-president; Dr. J. H. Evans, Beatyville, secretary-treasurer. This association, which is composed of members from the eastern part of Kentucky, will hold its next session in Jackson.

Deaths.

Dr. John Neely died at his home in Franklin on June 19. He was one of the country's oldest physicians.

Dr. Charles Jefferson Stovall died at his home in Bowling Green on May 25. He was 62 years old and a retired physician and farmer.

Dr. James J. Gibson died at his home near Athens on May 29, after a stroke of apoplexy. He was 46 years old and a well known physician.

Dr. J. E. Johnson, Waverly, Ky., died at his home on May 25.

Dr. S. M. Glass, 53 years old, died in Boonville on July 22, of sarcoma of the throat.

Dr. J. P. Maddox, Owensboro, died at his home in that city on May 31.

Dr. S. P. Quisenberry died at his home near Hopkinsville on June 14.

LOUISIANA.

Dr. Oscar Dowling, of Shreveport and New Orleans, was elected by acclamation to succeed himself as a member of the board of trustees of the American Medical Association at its recent meeting in Detroit.

At New Orleans, the entire class of 74 men from the Medical Department of Tulane University were given their degrees on June 7.

At New Orleans, 52 out of the 60 applicants for license to practice medicine in the state were successful in their examination.

At New Orleans, Dr. Henry D. Elfer, who is 71 years old, received painful injuries by being thrown to the ground when a Dauphin Street car ran into the rear of the car from which he was alighting.

At New Orleans, it is reported that there has been a great decrease in hay fever due to the earnest attempts made by the association for the prevention of that disease.

Deaths.

Dr. J. W. Jones, 90 years old and a citizen of Baton Rouge, died at his home in that city on June 24. He was a South Carolinian by birth, and took part in the war between the states. He graduated from Tulane University in 1852.

MARYLAND.

The merger of the University of Maryland Medical College and the Baltimore College of Physicians and Surgeons has recently been announced.

Dr. E. L. Whitney has resigned his position as professor of physiological chemistry, pharmacology and clinical pathology in the University of Maryland to take up the practice of medicine in Portland, Oregon.

Dr. V. N. Leonard, formerly of Johns Hopkins, has moved to New York, where he has accepted the position of assistant attending gynecologist to the Post-Graduate Hospital.

At Baltimore, Johns Hopkins University will receive another valuable addition when the Rockefeller Foundation has established their proposed School of Hygiene and Public Health in connection with this institution. This school is expected to be opened by October, 1917.

At Baltimore, Dr. Kenneth Dows, of New York, has recently made a gift to the Johns Hopkins University of $95,000, the object being the establishment and maintenance of a department for the study and prevention of tuberculosis.

Deaths.

Dr. T. A. Ashby, one of the oldest members of the faculty of the University of Maryland Medical School, died at his home on 1125 Madison Avenue on June 25.

Surgeon William Page McIntosh, formerly a native of Georgia, died at Longwood, Howard County, Maryland, on May 27. Dr. McIntosh was a member of the U. S. P. H. S. and had held positions in New Orleans, Mobile, Memphis, Portland, Baltimore and Louisville.

MISSISSIPPI.

Dr. W. H. Rowan has been elected to the position of superintendent of the Mississippi Tuberculosis Sanitarium which will shortly be established in that state. Dr. Rowan, after resigning from the position of state sanitary inspector two years ago, has been connected with the Rockefeller Foundation in their sanitary work in Central America.

At Jackson, exactly half of the 62 applicants for license to practice in the state were successful in the examinations.

The malarial survey of Columbus and vicinity, by experts of the United States Public Health Service, was completed about May 15.

An alarming epidemic of small pox has broken out among the Negroes of ones county. It is

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YOUR hay fever patients

may be as responsive as this one:

"Miss M. T., 21, had had hay-fever since childhood from May to frost. Gave calcium chlorid 1 gm. t. i. d., July 2d. July 28, greatly relieved. August 13, no hay-fever symptoms left; and had none during the rest of the season." (See Dr. Wilson's report, *J. A. M. A.*, March 4, 1916 for further data.)

You are always sure of the purity of the calcium chloride when you use our "Elixir Chloro-Calcium"—five grains of the c. p. salt to the fldrm.; and it never disturbs the patient's stomach, as even the same salt is liable to do when it is administered in water

Our process of manufacture of this Elixir eliminates the stomach-disturbing feature of calcium-chloride.

We have some interesting literature on hay-fever which is yours for the asking.

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FOR CAREFUL AND ACCURATE LABORATORY EXAMINATIONS SEND YOUR SPECIMENS TO THE NATIONAL PATHOLOGICAL LABORATORY, 18 EAST 41st STREET, NEW YORK, OR 5 SOUTH WABASH AVENUE, CHICAGO.

All Chemical and Bacteriological Tests

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thought that there will be little difficulty, however, in preventing the spread of the disease.

Deaths.

Dr. Robert R. Chisholm died after a long illness at his home in Summit, at the age of 50 years.

Dr. John W. Young, a pioneer citizen and widely known physician of Natchez, died on June 29. He had held many positions of prominence and trust during his long life work in his state.

MISSOURI.

Dr. William S. Culpepper was recently appointed division surgeon of the 'Frisco at Willow Springs.

NORTH CAROLINA.

At Wadesboro the formal opening of the Anson County Sanatorium was held on July 4. The occasion was accompanied by several clinics and the reading of some interesting papers.

Deaths.

Dr. Paul Paquin, formerly of Asheville, died at his home in Kansas City, Missouri, on June 23, after an illness lasting about a month.

Dr. William Washington Denny died at his home in Pink Hill, at the age of 83 years, on July 2.

OKLAHOMA.

Dr. J. D. Pate, of Boswell, suffered a serious accident, having been kicked in the head by a horse.

Upon the request of Surgeon General Blue, Dr. John W. Duke, Guthrie, state health commissioner, is collecting data looking toward the determination of the number of cases of pemphigus in the United States.

The wedding of Dr. J. C. Williams and Miss Catherine Corum, both of Stroud, was solemnized in Kansas City recently.

SOUTH CAROLINA.

The United States Public Health Service has just completed a very thorough survey of Greenville County.

At Columbia, the State Board of Charities and Corrections held their semi-annual meeting on May 25. At this meeting the office of chairman was again bestowed upon Dr. George B. Cromer, Newberry. The entire board, consisting of Dr. Cody, R. Hayne King of Charleston, L. E. Carrigan of Society Hill and D. D. Wallace of Spartanburg, were re-elected.

Deaths.

Dr. R. J. Gilliland, of Easley, after an illness of about two weeks, died at his home on June 25.

TENNESSEE.

At Chattanooga, according to a decision in the Jasper Circuit Court, the Chattanooga and Tennessee Power Company is held liable for the epidemic of malaria which has occurred along the banks of the Tennessee since the completion of the Hales Bar dam.

At Chattanooga, a clean-up and educational campaign has been in progress looking toward the prevention of a typhoid fever epidemic.

At Memphis, there was a very encouraging enrollment at the Medical Department of the University of Tennessee Summer School.

At Chattanooga, the free medical examination of school children has been inaugurated.

The annual session of the Association of Surgeons of the Southern Railway was closed in Chattanooga on the 7th of July. The following officers were elected for the ensuing year: Dr. Cooper Holtzclaw, Chattanooga, president; Dr W. H. Armstrong, Rogersville, Tenn., first vice president; Dr. T. F. Robinson, Bessemer, Ala. second vice-president; Dr. J. H. Taylor, Columbia, S. C., and Dr. H. McHatton, Macon, Ga., third and fourth vice-presidents; Dr. J. U. Ray, Woodstock, Ala., secretary-treasurer, and Dr. F. R. Gobbel, English, Ind., member of the executive committee for five years. The next convention of the association will be held at Jacksonville, Florida.

At Memphis, the management of the Baptist Memorial Hospital was host at a banquet given to the members of the graduating class of the University of Tennessee.

At Nashville, a new publication is being edited by the school medical staff and published by the city board of education. The name of this is the "School Medical Examiner," and is published for the purpose of educating the parents in the care of their children and to encourage the carrying out of the recommendations of the medical advisors.

Deaths.

Dr. T. E. Bales, after an illness of several years from pernicious anemia, died at his home in McMinnville on May 25. He was 54 years of age.

Dr. James C. Moody, formerly of Clarksville, died at his home in St. Louis on June 7.

Dr. T. H. Coe, Byrdstown, died of tuberculosis at his home in that city at the age of 57 years.

Dr. J. H. Sparks, of Camden, died at his home near that city on July 7.

Dr. Herher Jones, a prominent Memphis physician, died on June 26, at the age of 68.

TEXAS.

At Dallas, after a special inspection by Dr. Arthur D. Bevan, the Baylor Medical School has been placed in class "A" by the American Medical Association.

Surgeon B. J. Lloyd, of the U. S. Public Health Service, has been ordered to El Paso for special temporary duty in connection with the fight against the introduction of typhus fever from Mexico.

The medical officers of all the Texas railroads met with the state and federal health authorities in San Antonio on June 1 to organize a campaign against typhus fever in the state.

At Greenville, the North Texas Medical Association met in session on June 28.

At Harlington the physicians of the lower coast

(Continued on page 28)

Hard Dry Feces

are not only difficult to pass, but may give rise to (1) irritation and congestion of the rectum, which may influence fissures and hemorrhoids (2) by their physical pressure, they may affect prostatic and other genito-urinary conditions. These are in addition to (3) the effects of any autotoxemia that may arise.

HARD DRY FECES are often caused by over-extraction of fluid by the colon, or by lack of intestinal mucus, or both, but they are overcome by **INTEROL,** which not only lubricates them, but, being itself non-absorbable, it stays with them, and *keeps* them soft and mouldable so that they pass easily through constrictions.

With **INTEROL** well mixed in them, more **HARD DRY FECES** cannot form, but instead, **SOFT PLASTIC FECES,** so that the patient obtains evacuation without straining at stool, and life becomes worth living—so far, at least, as **INTEROL'S** combatting of obstipation-stasis-autotoxemia is concerned.

INTEROL* is more than "ordinary mineral oil": (1) it possesses *effective lubricating body* so that it clings to the fecal mass—**INTEROL** has efficient "spread and mix" properties (2) no "lighter" hydrocarbons to disturb the kidneys (3) no sulphur compounds to disturb digestion (4) no odor or flavor, so that the patient *can* take it and derive its benefit.

***INTEROL** booklet on request. Pint bottles, at druggists.

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Irritations, chafings, etc., are exasperating, but—

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quickly cools, soothes, and relieves. "Keeps the hands away, and doesn't grease the linen."

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For advice—the lawyer
For pain—the doctor

and for the doctor's use,—

K-Y ANALGESIC

which does not relieve every pain, but which is

"A POWER FOR COMFORT"

in a surprisingly great number of painful conditions, principally headache, neuralgia, and "rheumatic pain."

Where the physician does not wish to use a narcotic or a hypodermic, **K-Y ANALGESIC,** locally applied, will often be found sufficiently effective,—

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(Continued from page 26)

country and the lower Rio Grande Valley, met to discuss subjects of interest to the profession.

At Galveston, the University of Texas conferred degrees on 64 medical graduates.

At Dallas, the Baylor University College of Medicine and Pharmacy conferred degrees on 49 applicants.

Deaths.

Dr. Albert Gallatin Clopton, president of the State Medical Association in 1876, died in Texarkana on June 20.

Dr. Joseph Camp Phillips, specialist in diseases of the eye, ear, nose and throat, died at his home in Port Arthur, on July 3, from meningitis. He was a graduate of Tulane University, 1908, and held the chair in chemistry in the Mississippi Medical College at one time.

VIRGINIA.

Dr. Ennion G. Williams has been appointed to another term as state health commissioner.

At Richmond, on June 7, 124 men of the Medical College of Virginia received their degrees.

At Richmond, the business men of the city are lending their enthusiastic support to the effort of raising $250,000 for new buildings for the Memorial Hospital.

At Charlottesville, the medical alumni of the University of Virginia have organized, with Dr. Hugh H. Young, of Baltimore, as president, and Dr. J. V. Williamson, of Norfolk, secretary.

The scientific exhibit of Dr. J. Shelton Horsley, of Richmond, at the Detroit meeting of the American Medical Association was awarded a bronze medal.

Dr. Andrew Jacob Koontz, age 57, died of heart disease at his home in Independence on June 20.

Dr. R. F. Williams, 47 years, died at a local sanatorium in Richmond on June 14. Dr. Williams was at one time a member of the faculty of the Medical College of Virginia and once dean of the Medical Department of the University of Oklahoma.

Dr. Joseph Addington Gale, age 73, died at his home in Roanoke on July 5. He was a Fellow of the American College of Surgeons and chief surgeon of the New York and Western Railroad.

Surgeon Charles Poindexter Wertenbaker, United States Public Health Service, died at Charlottesville on July 12. He rendered important service during the yellow fever epidemic in 1905. He has recently had charge of the anti-tuberculosis work of the United States Public Health Service.

WEST VIRGINIA.

The State Department of Health is endeavoring to educate the people in matters of sanitation and public health by placing large placards in the stores and postoffices in rural communities throughout the state.

Deaths.

Dr. Robert M. Marshall died at his home in Shenandoah Junction on June 22. He was a graduate of the University of Maryland, 1866, and for nearly 50 years a practitioner in the state.

PLACEBOES

For Her

She had just been vaccinated.

"Now, doctor," she asked, "will the spot show?"

"That, madam," answered the doctor, "depends upon you."—Ex.

Incorrect Diagnosis

Physician—"From this brief examination I am of the opinion that you are suffering from clergyman's sore throat."

Patient—"The hell you say!"

Physician (hastily)—"But it is quite possible I'm wrong. I will look again."—Ex.

Gave Him a Pointer

"I'd like to see Dr. Jones," said the lady caller.

"Dr. Jones is engaged, ma'am," replied the new office girl.

"Engaged, fiddlesticks," exclaimed the lady. "He's married, and I'm his wife."—Ex.

Pretty Lively

Doctor—"Well, and how did you find yourself this morning?"

Patient—"Oh, I just opened my eyes and there I was."—Ex.

She Might Blush

"Do you know anything, doctor," said Mrs. Finnikin, "that will put a little color into my cheeks? I am so dreadfully pale."

"Well, madam," replied Dr. Blunt, "perhaps if I tell you that you have a hole in your stocking about the size of a five-shilling piece it may have the desired effect."—Ex.

Anything Else?

"If you please, ma'am, could the doctor come at once? Miss Ethel's got spots; Master Tom, whooping cough; Mr. Charles, wot looks like German measles, and the master was under the car when it started sudden-like."

"I'll tell him. What number is the house?"

"No, number, ma'm. The name is Sans Souci."—Ex.

But One Temptation

Sick Man—"It doesn't make much difference whether I die now or not."

Doctor—"Why, my good man, why not?"

Sick Man—"Well, I must owe you several hundred dollars by now, and I'll be in the hole anyway."—Ex.

(Continued on page 30)

Efficient Collecting

of old, Hard-to-get Doctors' accounts is an important part of our business—not a side line. Maximum amount of money in minimum length of time; no advance charges. Working on a strictly commission basis, we must know how. Firm, tho diplomatic, our methods get the money without estranging patients and save you work, worry and expense. This unique service, based on 14 years success is endorsed by the Medical Profession and Press. Read this:

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No other cooking process so fits these grains for food.

A favorite way of serving is in bowls of milk. The grains are crisp and toasted. They are airy bubbles, four times as porous as bread. They are whole-grain foods.

As supper foods for children they particularly appeal to thousands of physicians.

The Quaker Oats Company
Chicago (1375)

Puffed Wheat, 12c
Puffed Rice, 15c
Corn Puffs, Corn Hearts Puffed **15c**
Except in Extreme West

(Continued from page 28)

Correct Diagnosis

"Ma husban's po'ly, ma'am. He's got exclamatory rheumatism."

"You mean inflammatory, Martha. Exclamatory is from exclaim, which means to cry out."

"Yes, ma'am, dat's what it is. He hollers if anybody goes near him.—Ex.

A Cinch

"I understand that Joe, the barber, is studying dentistry."

"Is that so? Well, it ought to come easy for him. He already knows how to work the chair."

Hope They Choke

A Sewanee professor's children were in the nursery where the little girl had with much difficulty persuaded her older brother, age 10, to play dolls with her.

"Go 'phone for the doctor," directed Mary.

John walked over to an imaginary 'phone and began: "Is that you, doctor? Well, the dolls are sick, but I just wanted to say that you needn't come. I want 'em to die."

Fore-Warned

"Doctor," said an acquaintance as the M.D. was leaving the lunch counter, "would you be so good as to hand me that menu of the table d'hote?"

"That's no table d'hote; it's an antidote I wrote a moment ago while waiting for my green apple pie."

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Bureau of Chemistry, U. S. Department of Agriculture.

"The spurious aspirin is a mixture of either calcium phosphate and starch, cream of tartar and citric acid with some alum; or milk sugar, starch and calcium acid phosphate."—(From **N. Y. Department of Health "Weekly Bulletin"**, Nov. 6, 1915)

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We take a food which has long been a favorite morning dainty. Into that food we roll unground bran —25 per cent.

We use soft wheat bran, which is tender. We use it in flake form, which is efficient.

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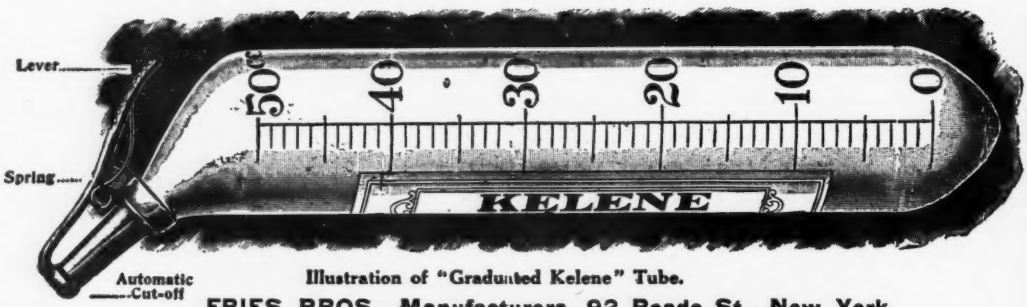

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For the Prevention and Treatment of

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Hay Fever Vaccine "Fall" Mulford contains the protein extract from the pollens of ragweed, golden rod and maize, dissolved in physiological saline solution and accurately standardized, and may be used without preliminary diagnostic tests. If treatment does not give entire relief, skin tests may be made to discover possible hypersusceptibility to pollen not contained in the Vaccine.

Noon, working in Sir Almroth Wright's Laboratory, was the first to report successful results in the treatment or prevention of hay fever with subcutaneous injections of pollen extracts. Clowes, Lovell, Lowdermilk, Ulrich, Hitchens and Brown, Koessler, Manning, Cooke, Wood, Goodale, and many other scientists have amply confirmed Noon's work.

Hay Fever Vaccine "Fall" is furnished in:

Packages containing 4 sterile glass syringes
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In single syringes "D" strength, 1.50

Syringe	A	contains	0.0025	mg.	extract	of	the	pollen protein
"	B	"	0.005	"	"	"	"	"
"	C	"	0.01	"	"	"	"	"
"	D	"	0.02	"	"	"	"	"

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For Immunization against Hay Fever, first dose (Syringe A) should be given at least 30 days before expected attack, followed by B, C and D at five-day intervals. Syringe D strength Vaccine should be used at weekly intervals during the entire period of accustomed attack or until immunity is established.

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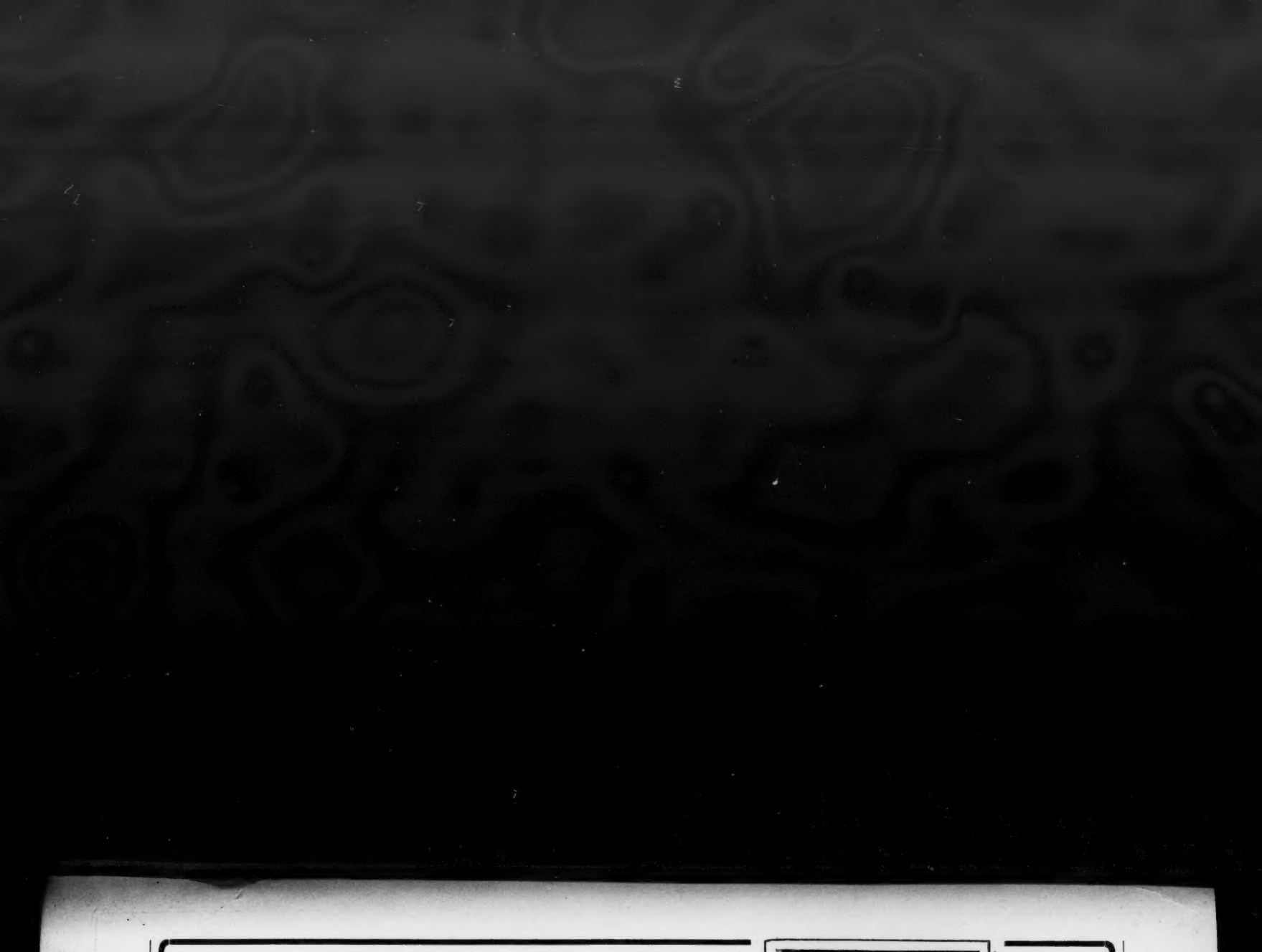

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Adrenalin Chloride, 1 part; physiological salt solution (with 0.5% Chloretone), 1000 parts.

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